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TRANSACTIONS
OF
THE HIGHLAND AND AGRICULTURAL
SOCIETY OF SCOTLAND

WITH
AN ABSTRACT OF THE PROCEEDINGS AT BOARD AND GENERAL
MEETINGS, THE PREMIUMS OFFERED BY THE SOCIETY
IN 1891, AND LIST OF MEMBERS
PUBLISHED ANNUALLY



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TRANSACTIONS
OF
THE HIGHLAND AND AGRICULTURAL
SOCIETY OF SCOTLAND.

THE ADVANTAGES OF THE WEIGH-BRIDGE
TO THE FARMER.

By JOHN D. M'JANNET, Woodlands, Stirling.

THE object of this paper is to endeavour to show by the results of experiments personally carried out, and by actual business transactions, the advantages which the farmer may derive from the regular use of the weigh-bridge.

In order to cope successfully with foreign competition, which shows a tendency to increase rather than diminish, it is absolutely necessary for the British farmer to exercise the greatest care in what may be called the details of his business. To correct account-keeping he must add a close supervision over every item of expenditure; and in disposing of his produce, the result of his enterprise and industry, he must be sure that he knows its value, so that he may reap the full reward of his labours. In regard to grain, he can check his own valuation by referring to the prices published weekly by the Government; but in regard to live stock, there is reason to fear that the farmer, having no similar guide, unwittingly bestows upon others a considerable part of the profit which ought to belong exclusively to himself.

Both in buying and selling he is placed under a certain disadvantage. Mr Westley Richards of Ashwell Lodge, Oakham,

Rutlandshire, a gentleman who has devoted much attention to this subject, estimates the average loss to the farmer at 45s. per head on fat stock sold, and at 20s. per head on store stock purchased. With a computed annual slaughter of 2,100,000 head of cattle, any one can calculate the estimated loss to the farming interest. It is to avoid this enormous loss that I have so strongly advocated the universal use of the weigh-bridge at the farm.

The selling of live stock by weight is said to have been practised in China from time immemorial; and Sir Tatton Sykes, in a communication from Cairo to 'The Field,' states that the Egyptians sold their cattle by live-weight nearly four thousand years ago—one of the sculptures at Thebes showing a bullock standing in a weighing-scale. However this may be, the system is certainly not new. For about thirty years the scales have been in general use in America for the weighing of cattle. When sent into the market, the animals are graded by competent authorities, and then sold by the agents at so much per lb. The total sum payable is determined by the weigh-bridge, without which business could not be conducted, so extensive is the cattle trade in America.

In our own country, the old custom of buying and selling live stock "by eye and hand" still prevails. It will be seen in the course of this paper how the adherence to ancient custom tells against the farmer in his dealings with the butcher in fat, and the dealer in store, cattle; but if one thinks of it for a moment, the uncertainty of this method of judging—or rather guessing—the value of an animal, must be apparent to every intelligent person. Handling is, doubtless, very useful; but no one will maintain that it is an unerring method of determining, say, the quantity of carcass an animal will yield when dressed. Nor are the ordinary rules for finding the weight of live stock by measurement of much practical assistance to the farmer. Here is an example of such rules taken from the 'Agriculturist's Calculator': "To get the dimensions, let the animal be made to stand straight, and take the girth close behind the fore-legs, and the length from the top of the shoulder to the bone at the rump, perpendicular to the extremity of the buttock." How is the animal to be made to hold himself straight? If not straight, his length will be a couple of inches short. How is the tape to be tightened in taking the girth? Are there not two ways of applying the tape—one for the seller and the other for the buyer? What is the proper point at the top of the shoulder, or at the bone of the rump? I have known experienced farmers who differed in their ideas of how the tape should be applied, and of course the results of their measurements differed accordingly. If, as has been calculated, a differ-

ence of an inch in measurement is equal to a stone in weight, it will be readily acknowledged that the tape is a very unsatisfactory instrument for determining the value of fat cattle. This was proved so long ago as 1834, when four bullocks exhibited at the Highland and Agricultural Society's Show of that year were measured, and their dead-weight calculated by various tables. All of these calculations fell far short of the real weight, and the nearest would have been a loss to the farmer of over 50 stones, or, according to the price of beef at that time in Smithfield market, of £21 on the four beasts.

Before giving my own experience of the weigh-bridge, it may be useful to sketch briefly the progress of the present movement in favour of the weighing of live stock.

It appears that between forty and fifty years ago a few English stock-keepers weighed their fattening cattle, using the weights chiefly as a guide to their treatment, but incidentally also as a basis for sale. It also appears that about thirty years ago many thousands of sheep were sold in Yorkshire by live-weight every year for the Leeds and Wakefield markets, and the system was found to work very satisfactorily, but somehow or other it was allowed to fall into disuse.

It was not until Messrs Clare Sewell Read and Albert Pell, in their report on "American Agriculture" to the Royal Commission on Agriculture, directed special attention to the universal adoption across the Atlantic of weigh-bridges in marketing live stock, that the subject was taken up in earnest. Sir John B. Lawes, Bart., who had used the scales most effectively in his experiments in his laboratory on the composition of oxen, sheep, and pigs, gave the weigh-bridge his powerful support; and Mr Westley Richards and other eminent English agriculturists pressed the question forward by giving to farmers' clubs and agricultural societies the results of their own experience in testing the American system. I may mention here that the use of the scales in weighing live stock was not quite unknown to Scottish farmers prior to the date of Messrs Read and Pell's report. In the 'Transactions of the Highland and Agricultural Society of Scotland' for 1873, there is a paper by Mr J. T. S. Paterson, Plean (now residing in Edinburgh), on "The Best Modes of Housing Fattening Cattle." By a series of careful weighings of twelve bullocks, he found that the box-feeding system yielded the best results. Had he gone a step further, and shown the advantage of selling stock by live-weight, he would have anticipated the movement which derived its first impetus from the account given of the practice in America. The Woburn feeding experiments had also demonstrated the usefulness of the weigh-bridge, a work which is still being carried on to the great benefit of agriculturists. In

regard to selling stock by live-weight in this country, Mr F. Muntz, of Umberslade, near Birmingham, is credited with having for seven years prior to 1889 published weights annually in the catalogue of his September sales; but the auctioneer's experience was that butchers took no notice whatever of these weights, and the sales were conducted in the usual way. I find from a specimen of the quotations at Mr Muntz's sales, with which I have been favoured by Mr Westley Richards, that the cattle are simply described as "fat" and "not fat," which is too vague for the prices to be any guide to the farmer.

In 1886, Mr R. Henry Rew, of Oxford, read a valuable paper on "Selling Stock by Live-weight," to the members of the Bath and West of England Society, in which he proposed that the authorities of every cattle market licensed to take tolls should be compelled to erect a weigh-bridge suitable for the weighing of live stock. This was provided for in the Markets and Fairs (Weighing of Cattle) Act, 1887, which was passed mainly through the exertions of Mr Westley Richards. Although applicable to Scotland, the provisions of this Act remained practically a dead letter. Market authorities did not encourage the weighing of cattle, and in some places no machine was erected, while at markets where there was a machine, no facilities were given to the farmer to weigh his cattle.

Having been called as a witness by the Royal Commission on Market Rights and Tolls in 1889, I gave evidence in favour of extending the application of the Act of 1887 to auction marts where cattle are sold on commission, and the appointment of a Government inspector to see that the Act is properly carried out by the market authorities. My belief is, that if these suggestions were given effect to, Scottish farmers, at least, would not be slow to take advantage of the weigh-bridge in the buying and selling of cattle. In speaking of the progress of the movement in Scotland, I ought to mention that, about ten years ago, Messrs John Swan & Sons, Edinburgh, erected a weigh-bridge at their auction mart at Haymarket. This was the result of a visit to America by Mr Thomas Swan, who saw the usefulness of the system to at least one class of his customers. Cattle were regularly weighed at Messrs Swan's sales, but the live-weight quotations were never reported. Few farmers understood the purpose of the weigh-bridge, which was there mainly for the benefit of those butchers who wished to take advantage of it.

Coming now to speak of my own connection with the movement, it seems to me that a plain narrative of my experiences may be at once more interesting and more instructive than

any formal statement or argumentative discussion of the advantages of the weigh-bridge in farming operations. These will, I trust, be clearly enough brought out in what I have to say, and in the Tables appended to this paper.

Twenty years ago, when I was a coalmaster in the parish of Kilsyth, I bought annually at Falkirk Tryst a lot of two-year-old West Highland bullocks, and on getting them home I branded their horns with my stamp, and put them over the colliery weigh-bridge, making a careful note of their weights. I watched their progress on pasture, weighing them at regular intervals during the winter and summer months. After I became a farmer, about seven years ago, I had of course to fatten cattle, and in order to ascertain how they were progressing, I sent through a pit-head weigh-bridge to my farm in Fifeshire. There I weighed my cattle regularly, and valued them according to their weight. I visited Messrs Swan & Son's auction mart in Edinburgh, and marked the weights of the cattle exposed for sale, and the prices they realised. I was then in a position, on weighing my own cattle, to estimate what they should bring per cwt. live-weight. I succeeded in coming to terms with butchers in the neighbourhood, and sold several lots profitably, at value ascertained by the weigh-bridge. My farm was in a bad state, having been allowed to become exhausted, and during the process of putting it in order, I invited a few farming friends to see my improvements, on which I wished their opinions. Naturally, I showed them my feeding cattle, and I was surprised to find that none of them would venture to put a value on the animals by handling them. On one occasion I had three farmers of experience to whom I showed a fat bullock, and for curiosity's sake I gave each a slip of paper, and asked them to mark down separately the value which they would put upon it, if it were their own. The result showed a difference of £3 between the highest and the lowest estimates. As for the percentage of carcass, that was a thing beyond their powers of guessing. They could give no estimate of the quantity of beef this particular bullock would yield. I was much struck with what I considered to be a weak point in modern farming, and I have been working ever since to convince my brother farmers that through lack of the knowledge which the weigh-bridge affords, they are actually throwing away a considerable part of the fruit of their labour.

I was pretty ignorant myself in many ways, and before coming publicly before the farming world, I resolved to be a learner for a little longer, and I began a series of experiments for the purpose of self-equipment. I weighed a calf whenever it was dropped, and continued the weighings monthly for six months, to ascertain its increase. I weighed my lambs

at birth, and noted their development by monthly weighings. I weighed one-year-old stirks, and marked their progress on the pasture, in the wintering quarters, on pasture again the following year, and in the feeding-boxes afterwards. I have never weighed pigs, and feel as ignorant about them as I imagine the average farmer is about the live-weight of cattle and sheep. I have devoted special attention to the progress of fattening cattle, as will be seen from the annexed tables.

One or two things which the tables do not show I may mention here, as examples of the kind of information a farmer may obtain from the weigh-bridge. I very early discovered that it cost more to fatten cattle than the value of the increase in weight. In a recent number of an Agricultural paper there appeared the result of an experiment conducted by Professor Shaw, Ontario Agricultural College, Canada, one of whose conclusions was as follows: "That with food at present prices, such as that used above (maize ensilage and meal), steers weighing from 1300 lb. to 1500 lb. can be made to gain on an average 1.801 lb. per day, and at an average cost of 21.053 cents per day for the food fed." Converting this calculation into English money, it appears that a gain of 1 lb. 13 oz. cost 10½d. or 6d. per lb. As the value of each lb. in Scotland is 4d., there would thus be a loss in feeding of 2d. per lb.

My own experience was similar to Professor Shaw's. I bought my stores at 32s. per cwt. in the month of October. A bullock weighing 10 cwt., therefore, cost me £16. I put on 2 cwt. of extra weight, at a cost of £4, and I sold the 12 cwt. at 35s. per cwt., or £21, being a profit of £5. From this deduct £4 for feeding stuff, and £1 for attendance, which makes the account equal. In other words, it cost me 40s. to produce 1 cwt. of weight, which was only worth 35s. It was evident I had bought my stores too dear, and my weigh-bridge told me that I must buy them at 5s. per cwt. less than the price I expect to get for them when fat.

As Sir John B. Lawes has remarked, "What is really wanted, and what every farmer should strive for, is to bring every transaction within the range of calculation."

The weigh-bridge also informed me how to sell cattle at different hours of the day. The table on the next page shows the variations in the weight of a couple of fattening bullocks.

My instructions to my grieve, therefore, were, that if a butcher came to the farm in the morning to buy a beast, the price asked was to be higher than if he came at noon, but if he came at night, less than the mid-day price should be sought.

One more illustration of information incidentally obtained from the weigh-bridge was the shrinkage of an animal during twenty-four hours. I send some of my cattle, after being

weighed at the farm on the Monday, to be sold in Edinburgh the following day, and I have found repeatedly, in comparing the weights, that they lost $7\frac{1}{4}$ lb. per cwt. during the interval. Knowing the market price and what to deduct for shrinkage, I was able to tell almost precisely what the cattle would bring in Edinburgh.

Number of Bullock.	LIVE-WEIGHT.				
	Before feeding, 6 A.M.	At 9 A.M.	At 12 NOON.	At 3 P.M.	After feeding, 6 P.M.
1	cwt. qr. lb. 11 1 0	cwt. qr. lb. 11 1 14	cwt. qr. lb. 11 2 0	cwt. qr. lb. 11 2 8	cwt. qr. lb. 11 3 0
2	10 2 14	10 3 0	10 3 6	10 3 7	11 0 3
Fed thus {	Turnips, 6.10 A.M., 28 lb.	Cakes, 10 A.M., 5 lb.	Turnips, 10.45 A.M., 28 lb.	Cakes, 4 P.M., 5 lb.	Turnips, 4.45 P.M., 28 lb.

And hay twice during the twelve hours. Next morning the cattle were back to 11 cwt. 1 qr. 0 lb., and 10 cwt. 2 qr. 14 lb.

In order to ascertain the percentage of carcass to the live-weight, I killed a fat bullock on eight different occasions, weighing it carefully before and after being slaughtered, and finding the number of lb. of carcass in each cwt. of live-weight. From the results thus obtained, I prepared the subjoined table (p. 8) of live and dead weight of fat cattle.

This table has been published by a firm of auctioneers in Perth, in their 'Pocket Diary' for the present year, without my permission. The table was meant for the use of farmers like myself who have a weigh-bridge at home, and the carcass quantities are calculated on the unfasted live-weight of the animal taken at mid-day—consequently they do not apply to auction marts, where nearly all the cattle have been fasted for at least six to twelve hours. In order to make the table apply to fasted cattle, farmers should add from 42 lb. to 84 lb., according to size, the distance the animals have travelled, and the length of time they have fasted. I advise my friends, the auctioneers, to add this note to their next edition of my table, if they continue to honour it with a place in their diary. The dead-weight in the table is given in cwt., qrs., and lbs. instead of percentages, because I find the average farmer understands this method best.

I also killed several lambs and sheep, and ascertained their percentage of carcass in the same way.

After the experiments above-mentioned, I considered myself qualified to instruct my brother farmers in the use of the weigh-bridge; and on several occasions I invited a party to my farm in order to show them the superiority of weighing over any other method of judging the value of fat stock. The tabulated results of the first two public experiments at Over-Inzievar have already been published in papers by Mr Westley Richards and Mr Albert Pell, and I need not repeat the details here.

Live-weight.	Dead-weight.	Live-weight.	Dead-weight.	Live-weight.	Dead-weight.
cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.
7 0 0	4 0 0	9 3 0	5 2 8	12 2 0	7 0 16
7 0 14	4 0 8	9 3 14	5 2 16	12 2 14	7 0 24
7 1 0	4 0 16	10 0 0	5 2 24	12 3 0	7 1 4
7 1 14	4 0 24	10 0 14	5 3 4	12 3 14	7 1 12
7 2 0	4 1 4	10 1 0	5 3 12	13 0 0	7 1 20
7 2 14	4 1 12	10 1 14	5 3 20	13 0 14	7 2 0
7 3 0	4 1 20	10 2 0	6 0 0	13 1 0	7 2 8
7 3 14	4 2 0	10 2 14	6 0 8	13 1 14	7 2 16
8 0 0	4 2 8	10 3 0	6 0 16	13 2 0	7 2 24
8 0 14	4 2 16	10 3 14	6 0 24	13 2 14	7 3 4
8 1 0	4 2 24	11 0 0	6 1 4	13 3 0	7 3 12
8 1 14	4 3 4	11 0 14	6 1 12	13 3 14	7 3 20
8 2 0	4 3 12	11 1 0	6 1 20	14 0 0	8 0 0
8 2 14	4 3 20	11 1 14	6 2 0	14 0 14	8 0 8
8 3 0	5 0 0	11 2 0	6 2 8	14 1 0	8 0 16
8 3 14	5 0 8	11 2 14	6 2 16	14 1 14	8 0 24
9 0 0	5 0 16	11 3 0	6 2 24	14 2 0	8 1 4
9 0 14	5 0 24	11 3 14	6 3 4	14 2 14	8 1 12
9 1 0	5 1 4	12 0 0	6 3 12	14 3 0	8 1 20
9 1 14	5 1 12	12 0 14	6 3 20	14 3 14	8 2 0
9 2 0	5 1 20	12 1 0	7 0 0	15 0 0	8 2 8
9 2 14	5 2 0	12 1 14	7 0 8	15 0 14	8 2 16

Inferior cattle will yield *less* than these figures. Condition must remain a matter of judgment. Prime cattle will yield *more* than these figures.

The first experiment—19th January 1889—was witnessed by a party of thirty farmers from Fifeshire and Stirlingshire; four fat two-and-a-half-year-old English-bred bullocks were shown, and nine farmers undertook the task of valuing them according to their individual methods. The valuations ranged from £70, 10s. to £79, the average being £74, 0s. 6d. I stated that I considered the bullocks were worth 36s. per cwt. live-weight; and as the gross weight ascertained in presence of the company was 45 cwt. 21 lb., my estimated value was £81, 6s. 9d., or £7, 6s. 3d. above the average of my friends' valuations. When the animals were sold in Edinburgh ten days later they realised £81, 7s. 6d.

The second experiment—2d February 1889—was of a similar kind, the visitors being mostly Ayrshire farmers. Four prime fat English-bred bullocks, rising three years old, were the

subjects of calculation by nine of the farmers from Ayrshire and two farmers from Clackmannanshire. The highest valuation was £87, and the lowest £65, 3s. (a difference of £21, 17s.), the average being £73, 10s. 10d. My own valuation based on the live-weight was £73, 10s., and the price the four beasts realised at auction three days afterwards was £73, 15s. In this case, it will be seen, the weigh-bridge gave at once a result which it required the averaging of eleven farmers' valuations to approximate. A better proof of the value of this implement to the farmer who has cattle to sell could not be desired. It gives him the benefit of others' experience without the trouble of asking their opinion.

An experiment of a different character was made at Over-Inzievar on 14th December 1889, when my visitors were asked to estimate the dead-weight of a Canadian bullock. I had never killed one before. The following card was supplied to each of those who undertook the task:—

This Canadian bullock was purchased in Glasgow on the 17th July last. Up to the 12th October last he was on pasture, and had always a full bite, but received no cake. Nine weeks ago he was tied up, and put on feeding allowance. During the first fortnight his allowance was irregular; he just got what he ate, but by the 1st day of November he was getting a full allowance of feeding-stuffs—viz., 3 lb. of linseed cake, 3 lb. of cotton cake, 1½ lb. of bruised oats, and 1½ lb. of bruised barley per day, with turnips and oat straw.

The bullock is about to be slaughtered and dressed by a Glasgow killer, and as the carcass will be weighed *hot*, an allowance of 2 lb. per cwt. for shrinkage, and 5 lb. for tail and kidneys, will be deducted from the weight.

(Name).....

Farmer's estimate of the above bullock:—

1. His dressed carcass, when cold, should weigh cwt. qr. lb.

2. The bullock would have brought shillings per cwt., sinking the offal, according to this week's sales.

3. The offal should be as under—viz. :—

The hide	should weigh	 lb., and worth	.....
The tallow	"	..... "	.....
The head	"	..... "	.....
The feet	"	..... "	.....
The intestines	"	..... "	.....
The paunch	"	..... "	.....
The liver	"	..... "	.....
The heart	"	..... "	.....
The tongue	"	..... "	.....
The blood	"	..... "	.....
The lungs	"	..... "	.....

..... lb.
Add—Loss in killing "

Total offal lb.

Only the items 1 and 2 were filled up, no attempt being made to estimate the value or weight of the offal. The bullock was subjected to the usual handling by the examiners, some of whom also applied the tape. All were informed that the animal had lost 35 lb. since the previous night, having been fasted so as to be ready for the butcher. The guessers' cards having been filled up, signed, and sealed, the bullock was put on the weigh-bridge, and was found to weigh 11 cwt. 21 lb. After luncheon it was announced that the bullock had been slaughtered, and one of the company was deputed to go and do the weighing, and bring back his report. He did so, and on returning announced that the carcass had been duly dressed and weighed, and after deducting 3 lb. per cwt. on account of its being weighed hot, and 5 lb. for tail and kidneys, the total weight was 6 cwt. 2 qr. 18 lb., or rather over the average percentage of 57 per cent of live-weight. The papers given in by the different estimators were then opened and examined, when it was found that two had guessed the weight at 5 cwt. 3 qr.; two at 5 cwt. 3 qr. 14 lb.; one had put it at 6 cwt.; another at 6 cwt. 20 lb.; two others had set it down at 6 cwt. 1 qr.; and two others had put it down at 7 cwt. There was thus between the highest and the lowest estimates a difference of 1 cwt. 1 qr., which, at current prices, would amount to over £4. It was also notable that the great majority of estimates were considerably under the true weight of the animal.

All the farmers present expressed themselves as being greatly impressed with the value of the facts so clearly brought before them, and several of them intimated their intention of providing themselves each with a weigh-bridge without delay.

Besides the carcass, the offal had been carefully weighed, and was as follows: Hide, 83 lb.; tallow, 73 lb.; head, 27 lb.; feet, 17 lb.; intestines, 129 lb.; paunch, 19½ lb.; liver, 15 lb.; heart, 5½ lb.; tongue, 6 lb.; blood, 40 lb.; and lungs, 9½ lb. It was explained that the hide would fetch about 4d. per lb., or 27s. 8d. in all; the tallow about 3d. per lb., or 18s. 3d. in all; and the tongue about 6d. per lb., or 3s. in all; while the head would fetch about 2s. 6d., the feet 1s., the intestines, paunch, and lungs about 2s. 6d.; the liver 1s. 6d., the heart 1s. 3d., and the blood 1s., making a total of 58s. 7d. In fact, it might be generally computed that for every cwt. of dead-weight there was at least 8s. worth of offal.

The result of this experiment showed how much some of the valuers would have lost in selling the bullock had they relied on their own judgment. So much was the company impressed by what they had seen that the farmers from the Stirling district resolved to call upon their auctioneers to erect weigh-

bridges at their marts. When this was done, the first to respond was Mr Thomas Corson, of Oban and Stirling, who had a weigh-bridge in operation at his auction mart at Stirling in the second week of January 1890.

Since that time I have supplied the local newspapers with live-weight quotations, giving the price per cwt. as well as the price per head. Below is a copy of my form:—

STIRLING—FRIDAY.

Breed and Sex of Animal.	Live-weight.	Price of each.	Remarks on the Condition.	Calculated Price per cwt.
	cwt. qr. lb.	£ s. d.		£ s. d.
1 Canadian bullock . .	15 1 14	31 0 0	Prime	2 0 4
1 " . .	13 2 21	26 15 0	"	1 19 1
1 cross-bred bullock . .	14 1 7	29 5 0	"	2 0 10
1 " . .	14 3 0	31 5 0	"	2 2 5
1 black polled bullock . .	10 0 14	21 15 0	"	2 3 0
1 " . .	10 2 7	21 15 0	"	2 1 2
1 cross-bred bullock . .	17 1 21	31 10 0	Very good	1 16 1
1 " . .	11 2 14	20 10 0	"	1 15 3
1 " . .	11 3 7	21 0 0	"	1 15 8
2 blue-grey bullocks . .	25 2 0	50 0 0	Prime	1 19 3
1 brown polled bullock . .	14 1 7	26 5 0	"	1 16 8
1 home-fed Canadian . .	13 2 14	25 0 0	"	1 16 9
1 brown polled bullock . .	11 3 21	20 15 0	Very good	1 14 9
1 cross-bred heifer . .	10 2 14	19 0 0	"	1 15 9
1 " . .	10 2 21	18 5 0	"	1 14 3

Mr James Craig, of Ayr, followed Mr Corson's example; then came Messrs Lawrie & Symington, of Lanark; Messrs Oliver & Son, of Edinburgh; Messrs Speedie Brothers, of Stirling; Messrs John Swan & Sons, of Perth; and Messrs M'Donald, Fraser, & Co., of Perth and Dunfermline.

When an animal enters the ring at Mr Corson's mart it is weighed, and its weight marked on a blackboard by a responsible man. It is then sold in the usual way at so much per head, but the price per cwt. can easily be calculated. This is done for me at the principal marts, and quotations sent to the papers. I find farmers are interested in these quotations, and are always pleased to see their cattle reported. The quotations are, moreover, a check on the auctioneer, who does not know the animals selected for quotation. It is a gratifying sign of the progress the movement in favour of weighing live stock is making in Scotland, that one now hears the farmers at the sales talking of the price per cwt. instead of the price per head. They think their cattle should bring so much per cwt., and they leave the weigh-bridge to determine the total amount.

While the use of the scales at the auction mart is of great importance, it is at the farm that the weigh-bridge will be

found of most value. I consider that my weighing-machines are the most valuable implements on my farm, and have repaid their price over and over again. Every one who deals with the farmer uses the scales—the butcher, who buys his fat cattle; the hay-dealer, who buys his hay; the potato merchant, who buys his potatoes; the manure manufacturer, who sells him dissolved bones; the seed merchant, who supplies him with turnip-seed; the miller, who sells him his feeding-stuffs—every one of these calls in the assistance of the scales and weights. But when the farmer deals with the butcher, or meets dealer or farmer at fair or tryst, he has to depend solely on guess-work. Although the cattle or sheep bought or sold are worth from £30 to £36 per ton, no means are taken to ascertain their exact weight; while potatoes worth from £3 to £4 per ton, and hay worth from £2, 10s. to £3, 10s. per ton, must all be carefully weighed before accounts can be adjusted. The butcher buys his fat cattle on a pretty well-founded calculation of the value of the carcass to him; but farmers, despite their astuteness and experience, are, as a rule, not well versed as to the relation between the live and dead weight of their cattle. This for the reason that all their information and experience are derived from inspection of the live beasts. The butcher has the advantage of the farmer, for he sees the animals both dead and alive, and has, therefore, an opportunity of correcting and verifying his judgment, which the farmer does not possess. Now the weigh-bridge materially helps the farmer, for, given the live-weight of an animal, a good judge of the condition of cattle will come very near to the dead-weight. On this point, Sir John B. Lawes, in the preface to his useful Tables, says: “By the use of the weigh-bridge, the farmer is at once put into possession of that knowledge which has been acquired by auctioneers and butchers from years of experience. I myself can form no opinion as to the weight of the carcass of a bullock in handling it, but let me see it and place it upon the weigh-bridge, and I can form as correct an opinion in regard to the weight of the carcass as the most experienced butcher. Long experience in weighing satisfies me that a farmer rarely obtains for his fat stock their value according to the prices quoted in the newspapers by the auctioneers. He either receives less per stone, or he receives for less stones than the animals weigh,”—or, as I should put it, he either receives less per stone, or he is not paid for all the stones the animals yield. The weigh-bridge puts the farmer on a level with the butcher. Without it a farmer may lose not only by getting less than the value of his cattle, but by refusing a good offer through his ignorance of their live-weight and percentage of carcass. For instance, a butcher has often to supply a quantity of beef on short notice. He comes

up to my farm prepared to give a good price for my cattle. He makes me an offer, and the weigh-bridge tells me the price is a good one, and he gets the cattle. If I had not the weigh-bridge, I would be sure to ask a pound or two more than the butcher offered, and perhaps part with him without making a bargain. If I did so, and sent the cattle to market, I would likely find I would have to content myself with £1 less than the butcher's offer. The following incident, which occurred recently within my knowledge, illustrates this side of the question. A very active and enterprising farmer has a weigh-bridge at his farmstead, on which he weighs all the potatoes and hay he sells, and all the manure he buys; but he thinks he does not require to weigh his cattle in order to ascertain their value, although he could easily do this by placing on the platform of his weighing machine a wooden bullock-cage which any country joiner could make for 45s., or which he could easily make himself roughly. This gentleman had four very fine four-year-old West Highland bullocks, which he valued at £30 apiece. A local butcher called, looked at the cattle, and offered him £29 a-head for them, which offer was, however, refused. This took place on a Friday, and on the following Monday evening the four Highlanders were sent by rail to an auction mart in Edinburgh. While in the pens there, the bullocks were much admired, and the owner was in high glee, anticipating good prices, as cattle were selling higher than in the previous week. Their turn came, and the two best were placed on the weigh-bridge. They scaled 27 cwt. 2 qr., and sold for £28 each. The remaining pair scaled 26 cwt., and sold for £26, 5s. each, greatly to the disgust of the seller. Now these cattle yielded 40s. 7d. per live-weight cwt., just about the top price for prime-fed bullocks.

The seller received	£108	10	0
Less commission and expenses to Edinburgh	2	10	0
Net	£106	0	0

The offer he refused at home was £116, so that he lost £10 by not knowing that he had been offered that sum more than the value of his cattle. He now declares that he will have his weigh-bridge thoroughly overhauled, and a proper bullock-cage made and erected. How many farmers are in a similar position, and how many refuse good offers for their cattle at home, entirely through want of the knowledge which that simple contrivance, the weigh-bridge, can give them!

A friend of mine, who had been pretty severe on me and my weigh-bridge, happened to pick up six very nice West Highland heifers, which he summered and fed. When they were ripe for

slaughtering, he summoned the local butcher to inspect them. The latter offered £18 per head for the cattle, but the farmer had, of course, to ask £19, and allowed the butcher to go away without them. Two days afterwards the heifers were sent to Glasgow market, where they were weighed and sold at an average of £15, 10s. per head. The butcher enjoyed a quiet laugh, and my friend asked me where he could best buy a weigh-bridge. He has now got one erected at his farm. I know of at least half-a-dozen similar cases, where the farmer had to take less—sometimes a good deal less—at the auction mart than he was offered at home, and in every case the lesson learned by experience brought an order to the weigh-bridge makers.

Something more is wanted, however, than the mere selling of live stock by weight, before the benefits of the system can be generally enjoyed. The collection and publication of the market quotations of live-weight are of the utmost importance. As I have already mentioned, ever since the erection of a weigh-bridge at Mr Corson's auction mart in Stirling, I have collected quotations there; and as weigh-bridges were put up at other marts, I employed reporters to take notes of weights and prices, and these were forwarded by me to the press. Unfortunately, one of the leading Scottish newspapers has thought proper to reject the quotations so sent, on the ground that the sender is simply a private individual, although one would have thought that more dependence might be placed on the report of a neutral party, having no object to serve but the farmers' good, than on quotations furnished by interested auctioneers. At present the Government collect the market prices of wheat, barley, and oats, which are published weekly, and are of the greatest service to farmers. I see no reason why the same course should not be followed with regard to the prices of cattle, sheep, and pigs. Such quotations would be a reliable guide to the farmer in a branch of his business which is becoming his mainstay. The information could easily be collected by Government officials, and published weekly in a compact and intelligible form.

As showing how this might be done, on the next page I give the quotations for fat bullocks, "prime" and "very good," sold within the principal markets throughout Scotland during the six days previous to Christmas 1890:

Strangely enough, what is still a desideratum for Great Britain, is already supplied to Ireland. The Irish Land Commission employs qualified reporters to visit the principal fat markets and country fairs throughout Ireland, and collect live-weights and prices in addition to prices per head. These reports are sent to headquarters in Dublin, and from the office of the Land Commission live-weight returns are issued weekly. Copies are furnished to the various newspapers, and they also

appear in the Scottish press. The Irish farmer has not been long in finding out from my quotations that Scotland is a good market for his fat cattle, large numbers of which are being sold at present in Edinburgh, Glasgow, and Ayr markets.

Date of Sale.	Name of Market Town.	No. of Head.	Total Live-weight.	Total Price paid.	Average Live-weight.	Average per Head.	Calculated Price.			
							Per cwt.		Per stone.	
			cwt. qr. lb.	£ s. d.	cwt. qr. lb.	£ s. d.	£ s. d.	s. d.	£ s. d.	s. d.
Dec. 19	Stirling . . .	32	362 0 14	666 5 0	11 1 7	20 16 5	1 16 9	4 7		
22	Lanark . . .	23	217 0 0	391 0 0	9 1 20	17 0 0	1 16 0	4 6		
22	Perth . . .	91	959 0 0	1745 10 0	10 2 4	19 3 7	1 16 5	4 6½		
23	Ayr . . .	30	316 2 0	596 0 6	10 2 5	19 17 4	1 17 8	4 8½		
23	Dundee . . .	29	319 2 0	579 2 6	11 0 8	19 19 4	1 15 1	4 4½		
23	Edinburgh . .	188	1547 0 0	2847 17 6	10 0 24	20 12 9	1 18 0	4 9		
24	Glasgow . . .	26	277 0 0	486 5 0	10 2 17	18 11 0	1 14 7	4 4		
	Total . . .	369	3898 0 14	7312 0 0						
	Average . . .	..	10 3 9	19 16 3						

Equal to £1, 16s. 7d. per cwt., or 4s. 7d. per stone.

It is not only in the purchase and sale of stock that the weigh-bridge is useful in relation to cattle. A thorough knowledge of its capabilities will enable the farmer to select the most suitable breeds for feeding, and in the process of feeding itself, the weigh-bridge has proved itself to be invaluable. In proof of this, I need only refer to the feeding experiments carried on at Woburn, and to other well-known investigations, the results of which have materially assisted farmers in their choice of feeding-stuffs, &c. The progress made by fattening cattle, and the period at which nothing more can be done—in other words, the proper time to sell—can be ascertained with exactness by the weigh-bridge, which, if properly attended to, will always be found ready for its duty, and true in its record.

Mr Albert Pell suggests that tables giving the live-weights of cattle at various stages would be interesting, and appended to this paper will be found a few tables of this description.

Table I. gives the weighings of a home-bred shorthorn calf, showing the monthly increase for seven months.

Table II. shows similar weighings of a pair of home-bred cross quey calves (twins) for the first ten months of their existence.

Table III. gives the weighings with average daily increase of three Fifeshire cross-bred one-year-old bullocks at intervals during 364 days on my farm.

Table IV. contains the weighings of ten Irish stirks during 754 days on the farm, and shows the average daily increase.

Table V., which shows the increase of feeding cattle during 123 days on Over-Inzievar, is given for the purpose of com-

parison with one of Mr Paterson's tables (VI.), incorporated in his paper already referred to.

The result of the comparison is that the gain made by my cattle is similar to that illustrated by Mr Paterson's experiment in 1871, a proof that the mode of feeding adopted was a good one.

Table VII. shows the monthly weighings of seven Canadian bullocks during the last three months of the grazing season of 1890, for which time there was an average daily increase of $2\frac{1}{4}$ lb. The second part of the table gives the average daily increase of the same cattle in the feeding byre, up to date of sale to the butcher for slaughtering.

In addition to the service rendered by the weigh-bridge in connection with stock, it possesses great value with regard to everything which the farmer has to buy or sell. For every crop he grows it will be found to afford information of importance, and for many farm necessities it will supply him with a check on the dealers with whom he has transactions. Some time ago a new feeding material was largely advertised. It had a good analysis, and I ordered a ton for trial. In due course I received from the sellers an invoice for *twenty* bags, weighing one ton, accompanied by an intimation that they made it an invariable custom in the case of a first transaction to have payment before forwarding the stuff. In my reply, I stated that my terms were cash within seven days after delivery. I also mentioned that I had a weigh-bridge at my farm, and that my grieve weighed everything most carefully, and sampled the stuff. If all were right I immediately remitted payment by cheque. I stated further that a certain well-known firm, from which I bought all my cakes and manures, would answer any inquiries about me. Two days afterwards *twenty-two* bags, weighing $20\frac{1}{4}$ cwt., arrived. I consider that I am indebted to the weigh-bridge for the two extra bags weighing fully 200 lb. Of course I cannot say what became of the twenty bags originally invoiced to me, but I had the satisfaction of getting what I paid for.

As to the cost of a weigh-bridge, a good one can be got at from £13 to £15. This description of weigh-bridge will weigh carts and cattle, but a bullock weigh-bridge only suitable for weighing live stock can be obtained for £9. Second-hand weigh-bridges are always in the market, and can be obtained for a few pounds. These are thrown out of public works on the introduction of larger machines, and are sold as old iron. Although somewhat old-fashioned they are quite good enough for the farmer. Some farmers will grudge the smallest outlay for a weigh-bridge. An unfortunate coal-merchant offered to sell me his weigh-bridge, which was of an antiquated type, with

low lever and tray. I examined it, and found it in thorough order. The price was the very modest sum of £3, 10s. Having two weigh-bridges at my farm, I did not require it, but I wrote to a pretty extensive farmer who fed bullocks, and who had spoken to me about erecting a weigh-bridge, mentioning that such a thing was to be had, and quoting its price. He replied, "I'll take the weigh-bridge at 30s." My unfortunate friend got double this sum for it from a broker.

Farmers who do not care to go to the expense of getting a weigh-bridge for themselves, might take advantage of the public weigh-bridges in towns or at the railway stations, where cattle can be weighed at the small charge of 2d. per head. Where an estate is divided into small farms, one weigh-bridge near the centre might serve all the tenants.

Of course there are objections to the weigh-bridge, as there are to everything which does not accord with ancient custom and tradition. One objection is that it tells too much, while another is that it does not tell enough. Those who urge the first, contend that the weigh-bridge, by placing the farmer on equal terms with the butcher in the sale of cattle, deprives the latter of the advantage which he has only gained from years of labour. But what the weigh-bridge does for cattle is simply what machinery has done for manufactures. It produces uniformity and exactness where there were previously variation and uncertainty. To this extent, and no further, does it go. There is ample scope left for the exercise of superior intelligence and knowledge gained from experience.

It is precisely because of this that the second class of objectors complain of the insufficiency of the information afforded by the weigh-bridge. They say that while it gives the exact weight of an animal, it does not tell its quality or condition, and is therefore not a safe or even useful guide to the farmer. The answer is that no machine can ever fulfil the entire functions of the human mind, and into the buying and selling of cattle, as in every other mercantile transaction, there necessarily enters the working of mental faculties in regard to which no two men are alike. What is claimed for the weigh-bridge is that it gives the parties to a sale a reliable basis for calculation of value, leaving scope for the exercise of judgment in respect to the quality and condition of the animal to be sold.

Another objection sometimes heard is that the weigh-bridge, while undeniably advantageous to the farmer in selling his fat cattle, is of no use to him in buying his stores. Such, however, is not the case. The weigh-bridge prevents the farmer from giving too high a price for store cattle. Such a lottery as occurred lately at the Dundee Foreign Cattle Wharf Auction Mart, where a large number of Canadian store bullocks were

rushed through the ring in lots, could not have taken place had the buyers been accustomed to the use of the weigh-bridge at home. They would have bought with some knowledge of what they were doing.

I know from experience that if I give a big price for my stores, it is impossible to make a profit by keeping them and finally selling them fat at present prices. I know that last May several landowners purchased young Irish steers at a price equal to 47s. 6d. per cwt. Now this was too high, because the owners of these cattle could not possibly get a fair return for the food consumed.

The price per cwt. of stirks varies considerably with the season of the year. The dearest time is in the months of May and June, because during the following five months they make the most weight at the least cost, feeding, as they do, entirely on pasture. The cheapest time, again, is when they come off the grass, because they make little or nothing during the next three months in winter quarters. In February they begin to grow, and the price gradually rises till the month of May. Why cattle do not increase in weight during the winter months is because when weighed before going into winter quarters they are full of wet grass, and the change to dry feeding brings down the weight, which is also affected by the loss in condition owing to the coldness of the weather.

Irish cattle do not, as a rule, add to their weight in the same rapid proportion as those bred in England or Scotland. The lot of ten stirks whose weights are given in Table IV. were bought at Candlemas 1888, at a price which came to 23s. 3d. per cwt. when I got them to the farm. After keeping them 754 days, I sold them and got 35s. per cwt., which was just the price of prime beef at the time. This only left 5½d. per head for every day they were on the farm. As I have already stated in this paper, the lesson which the weigh-bridge teaches in regard to buying stores for feeding purposes in autumn is never to give more for them than 5s. per cwt. less than you expect to get for them when fat. Therefore the weighing of store cattle is not a "mere laughable farce" as one critic has hastily called it, but a really useful thing for the farmer who wishes to see what he gets for his money.

In conclusion, I would urge on my brother farmers the importance of transacting the part of their business with which this paper deals upon a sound commercial basis, instead of by guess-work. By erecting a weigh-bridge at their farms, they can sell their cattle at home, thereby saving the auctioneer's commission, and avoiding the risks of an uncertain market. If they prefer to sell at the auction marts, they would do well to send their cattle to auctioneers who favour the use of the

weigh-bridge, and who give the live-weight of their customers' cattle on their sale-note in addition to the price per head. The collection and publication of live-weight quotations by the Government is a matter of so much consequence that in my opinion the Highland and Agricultural Society would be doing good service by adding its weight and influence to the representations now being made on the subject to the officials of the Board of Trade. With such quotations as a guide to agriculturists, I believe that the general use of the weigh-bridge would in many cases make all the difference between profit and loss to the individual farmer.

{TABLE

TABLE I.—NOTE OF MONTHLY WEIGHINGS OF HOME-BRED SHORTHORN BULL CALF DURING THE SUMMER OF 1889.

Date . . .	March 29	April 27	May 25	June 22	July 20	Aug. 17	Sept. 14	Oct. 12	Nov. 9, 1889	Total increase in weight in 225 days, 485 lb.—equal to 1.93 lb. per day.
Age . . .	0	29 days	57 days	85 days	113 days	141 days	169 days	197 days	225 days	
Weight . .	90 lb.	140 lb.	206 lb.	259 lb.	315 lb.	366 lb.	413 lb.	476 lb.	525 lb.	
Increase . .	0	50 "	66 "	53 "	56 "	51 "	47 "	63 "	49 "	
per day . .	0	1.72	2.35	1.90	2.00	1.82	1.68	2.25	1.75	

TABLE II.—NOTE OF WEIGHINGS OF HOME-BRED CROSS-QUEY (TWIN) CALVES DURING THE FIRST TEN MONTHS OF THEIR EXISTENCE, 1890-91.

Date . . .	March 11	May 10	June 21	July 19	Aug. 30	Sept. 27	Nov. 11	Dec. 20	Jan. 10, 1891	Total average increase in weight in 305 days, 512 lb.—equal to 1.67 lb. per day.
Age . . .	0	60 days	102 days	130 days	172 days	200 days	245 days	284 days	305 days	
Weight, No. 1.	64 lb.	167 lb.	242 lb.	298 lb.	370 lb.	406 lb.	480 lb.	532 lb.	567 lb.	
" No. 2.	60 "	150 "	226 "	287 "	364 "	406 "	488 "	546 "	581 "	
Average increase in-crease }	0 "	96 "	75 "	58 "	74 "	39 "	78 "	55 "	35 "	
per day . .	0 "	1.60	1.78	2.07	1.76	1.40	1.73	1.40	1.66	

TABLE III.—NOTE OF WEIGHINGS OF THREE FIFESHIRE CROSS-BRED ONE-YEAR-OLD BULLOCKS DURING 364 DAYS ON FARM, 1889-90.

Farm No.	140 DAYS ON PASTURE LAND.				112 DAYS IN WINTER QUARTERS.			112 DAYS IN FEEDING-BYRE.				Total increase in the 364 days on the farm.	Average daily increase while on the farm.
	Live-weight on arrival, May 25, 1889.	Live-weight leaving pasture, October 12, 1889.	Increase in the 140 days on pasture.	Average daily increase on pasture.	Live-weight when tied up in byre, February 1, 1890.	Increase in the 112 days in the courts.	Average daily increase in courts.	Live-weight when sold on May 24, 1890.	Increase in the 112 days in byre.	Average daily increase in byre.	Total increase in the 364 days on the farm.		
1	cwt. 5 1 21 lb. 21	cwt. 8 2 14 qr. 2 lb. 14	lb. 357	lb. 2.55	cwt. 8 3 21 qr. 3 lb. 21	lb. 35	lb. 0.37	cwt. 10 2 0 qr. 2 lb. 0	lb. 175	lb. 1.56	lb. 567	lb. 1.58	lb. 1.58
2	cwt. 5 0 7 lb. 7	cwt. 7 3 14 qr. 3 lb. 14	lb. 315	lb. 2.25	cwt. 8 1 0 qr. 1 lb. 0	lb. 42	lb. 0.31	cwt. 10 1 14 qr. 1 lb. 14	lb. 238	lb. 2.12	lb. 595	lb. 1.63	lb. 1.63
3	cwt. 4 2 14 lb. 14	cwt. 7 1 14 qr. 1 lb. 14	lb. 308	lb. 2.20	cwt. 7 2 14 qr. 2 lb. 14	lb. 28	lb. 0.25	cwt. 9 2 14 qr. 2 lb. 14	lb. 224	lb. 2.00	lb. 560	lb. 1.53	lb. 1.53
Total	15 0 14	23 3 14	980	7.00	24 3 7	105	0.93	30 2 0	637	5.63	1722	4.74	4.74
Average	5 0 5	7 3 23	327	2.33	8 1 2	35	0.31	10 0 19	212	1.90	574	1.58	1.58

TABLE IV.—NOTE OF WEIGHINGS OF TEN IRISH STIRKS DURING THE 754 DAYS ON FARM.

Farm No.	LIVE-WEIGHT.						Total increase in the 754 days on farm.	Average daily increase on farm.
	On arrival very empty, Feb. 6, 1888.	When turned on to pasture for season, May 22, 1888.	When put into wintering quarters, Oct. 29, 1888.	When turned on to pasture for season, May 25, 1889.	When put into the feeding-hye, Oct. 12, 1889.	At the last weighing previous to disposal, March 1, 1890.		
	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	cwt. qr. lb.	lb.	lb.
1	4 0 7	4 3 14	6 3 7	7 3 14	10 0 14	12 0 0	889	1.18
2	4 0 0	5 1 21	7 2 0	8 3 0	10 3 0	11 3 14	882	1.17
3	3 3 0	4 2 14	7 2 14	8 2 0	10 3 0	12 2 7	987	1.30
4	3 2 21	4 1 14	7 0 0	8 2 7	10 3 21	12 1 0	959	1.27
5	3 2 14	4 2 7	6 3 21	8 0 0	10 2 21	12 3 0	1022	1.35
6	3 2 14	4 2 7	7 1 0	8 3 21	11 2 7	14 0 7	1169	1.55
7	3 2 7	4 2 0	5 3 14	7 2 0	9 3 21	11 1 21	882	1.17
8	3 2 0	4 2 0	6 3 7	8 3 14	9 2 21	10 2 14	798	1.05
9	3 1 21	4 1 14	6 0 7	7 2 0	9 1 14	11 1 0	875	1.17
10	3 1 21	4 0 0	7 1 0	8 0 21	10 0 14	11 3 7	938	1.24
Total . .	36 2 21	45 3 7	69 0 14	81 2 21	103 3 21	120 2 14	9401	12.45
Average :	3 2 19	4 2 9	6 3 18	8 0 19	10 1 16	12 0 7	940	1.24
Number of days	.	106	160	208	140	140	Total, 754 days.	
Increase in lb.	.	in courts. 102	on pasture. 261	in courts. 141	on pasture. 249	in byre. 187	Total, 940 lb.	
Average daily gain	.	0.96	1.63	0.67	1.75	1.34		

TABLE V.—NOTE OF WEIGHINGS OF FOUR 2½-YEAR-OLD ENGLISH-BRED BULLOCKS DURING THE 123 DAYS ON MY FARM.

No. of bullock.	Live-weight on Sept. 27, 1888.			Average daily increase in 32 days, October 29, 1888.	Average daily increase in 26 days, November 24, 1888.	Average daily increase in 35 days, December 29, 1888.	Average daily increase in 30 days, January 28, 1889.	Live-weight on Jan. 28, 1889.			Total increase in 123 days on the farm.	Average daily increase.
	cwt.	qr.	lb.	lb.	lb.	lb.	lb.	cwt.	qr.	lb.	lb.	lb.
1	9	0	14	2.18	2.96	2.40	2.80	11	3	21	315	2.56
2	8	2	14	2.62	2.96	2.60	3.73	11	3	14	364	2.96
3	9	0	0	2.18	1.54	2.00	3.03	11	2	0	280	2.27
4	8	0	0	2.84	1.61	2.60	2.56	10	2	21	301	2.44
Total . .	34	3	0	9.82	9.07	9.60	12.12	46	0	0	1260	10.23
Average .	8	2	21	2.45	2.27	2.40	3.03	11	2	0	315	2.56

TABLE VI.—NOTE OF MONTHLY WEIGHINGS OF THREE LOTS OF TWO-YEAR-OLD POLLED IRISH BULLOCKS, PUT UP FOR FATTENING AT PLEAN FARM, BANNOCKBURN, ON 3D NOVEMBER 1871.

Where fed.	Average live-weight on Nov. 3, 1871.			Average daily increase in 28 days, December 1, 1871.	Average daily increase in 28 days, December 29, 1871.	Average daily increase in 28 days, January 26, 1872.	Average daily increase in 28 days, February 23, 1872.	Average live-weight on Feb. 23, 1872.			Average total increase in 112 days of fattening.	Average daily increase while fattening.
	cwt.	qr.	lb.	lb.	lb.	lb.	lb.	cwt.	qr.	lb.	lb.	lb.
In byre .	9	0	4	2.28	2.00	2.50	2.60	11	1	13	261	2.33
In court .	9	0	3	2.28	2.00	2.53	2.68	11	1	17	266	2.37
In boxes .	9	0	12	2.40	2.00	2.68	2.75	11	2	8	276	2.46
Total . .	27	0	19	6.96	6.00	7.71	8.03	34	1	10	803	7.16
Average .	9	0	6	2.32	2.00	2.57	2.68	11	1	22	268	2.39

TABLE VII.—NOTE OF WEIGHINGS OF SEVEN THREE-YEAR-OLD CANADIAN BULLOCKS DURING THE 191 DAYS ON MY FARM.

FIRST PERIOD—84 Days on Pasture.

No. of bullock.	Live-weight on arrival, very empty, July 24, 1890.	Live-weight after 24 days of feeding, July 26, 1890.	Average daily increase in 7 days, Aug. 2, 1890.	Average daily increase in 28 days, Aug. 30, 1890.	Average daily increase in 28 days, Sept. 27, 1890.	Average daily increase in 21 days, Oct. 18, 1890.	Live-weight when taken off pasture, Oct. 18, 1890.	Total increase in 84 days on pasture.	Average daily increase on pasture.
	cwt. qr. lb.	cwt. qr. lb.	lb.	lb.	lb.	lb.	cwt. qr. lb.	lb.	lb.
11	8 2 7	8 3 0	3.00	3.75	1.50	0.00	10 1 0	168	2.00
12	8 3 14	9 1 7	7.00	2.50	2.75	0.66	11 0 21	210	2.50
13	8 1 14	8 2 21	6.00	2.75	2.25	0.00	10 1 7	182	2.16
14	8 3 21	9 1 14	4.00	3.50	3.25	1.00	11 2 0	238	2.83
16	9 2 0	9 3 21	8.00	1.75	1.00	1.33	11 1 14	161	1.91
17	8 1 7	8 2 21	3.00	4.50	3.00	0.00	10 3 0	231	2.75
18	8 0 14	8 2 14	4.00	2.00	1.75	1.00	10 0 0	154	1.71
Total	60 2 21	63 1 14	35.00	20.75	15.50	4.00	75 1 14	1344	15.86
Average	8 2 19	9 0 6	5.00	2.96	2.22	0.57	10 3 2	192	2.26

SECOND PERIOD—105 Days in Feeding-byre.

No. of bullock.	Live-weight when tied up in byre on Oct. 18, 1890.	Average daily increase in 28 days, Nov. 15, 1890.	Average daily increase in 28 days, Dec. 13, 1890.	Average daily increase in 28 days, Jan. 10, 1891.	Average daily increase in 21 days, Jan. 31, 1891.	Live-weight when sold to the butcher, Jan. 31, 1891.	Total increase in 105 days of fattening.	Average daily increase in feeding-byre.	Average daily increase while on my farm.
	cwt. qr. lb.	lb.	lb.	lb.	lb.	cwt. qr. lb.	lb.	lb.	lb.
11	10 1 0	3.00	0.50	2.00	2.66	12 0 14	210	2.00	2.08
12	11 0 21	2.50	1.75	1.50	3.00	13 0 21	224	2.13	2.52
13	10 1 7	3.75	1.50	1.75	1.33	12 1 7	224	2.13	2.31
14	11 2 0	2.00	0.75	3.25	0.66	13 0 14	182	1.73	2.45
16	11 1 14	1.50	0.25	3.00	3.33	18 0 21	203	1.93	2.16
17	10 3 0	1.25	0.00	2.50	1.66	12 0 0	140	1.33	2.16
18	10 0 0	2.25	1.75	1.00	2.66	11 3 0	196	1.86	2.12
Total . .	75 1 14	16.25	6.50	15.00	15.30	87 2 21	1379	13.11	15.80
Average .	10 3 2	2.32	0.93	2.14	2.18	12 2 3	197	1.87	2.26

COOKED AND UNCOOKED MEAL FOR DAIRY COWS.

By JOHN SPEIR, NEWTON FARM, NEWTON, GLASGOW.

Among the dairy farmers of the south and west of Scotland, few items of everyday practice are so unanimously believed in, and acted on, as the cooking of the meal of dairy cows. The preparation of the food is done in many ways, the best being generally acknowledged to be the boiling of the meal by steam into a thin porridge, which is afterwards mixed with whatever bulkier food is used, such as cut hay, straw, chaff, or grains. Others, again, mix the meal with the cut hay or chaff, and pour boiling water over it, and then let it lie some considerable time before use, generally from one to two hours; while some mix the meal and chaff as they are being served to the stock.

Strange as it may appear, the cooking of food for cattle is not very general other than in the dairy districts, and with the view of throwing some light on the question, the following experiment was carried out during the months of January, February, March, and April of 1890. Eight cows, all about five or six years old, as nearly the same size as possible, and all several months calved, were selected for the experiment. During the continuance of it they were housed in a byre by themselves, and the milk given by each weighed and tabulated at every milking. Every second day about three gills of milk were taken from that yielded by each cow, as soon as the milking was finished—all the samples of milk from the cows getting cooked food being put into one vessel, while those from the others were put into a second. With these mixed samples four cream-tubes were filled, two of which were $1\frac{3}{4}$ inch in diameter and 9 inches long, while the other two were of thick glass tubing $\frac{3}{8}$ -inch in diameter, such as is in common use for the water-gauges of steam-boilers. The wide tubes stood exposed to the air of the milk-room, the small ones were immersed in cold water. By the latter system the whole cream appeared to be thrown up in a very few hours, while the large tubes took from twelve to eighteen hours. Samples of the milk yielded by both lots of cows were churned during the continuance of the experiment, sixty churnings being made in all. Of these, eight were rejected as being faulty and unreliable owing to accidents of various kinds. The churn used was a Speedwell Crystal No. 1, which has two barrels, each of which works well with 2 lb. of milk. For experiments of this kind I have found this churn simply invaluable, being accurate in its results, easy to keep clean, and a pleasure to work. Each

lot of cows were kept on the same class of food for from two to five weeks, and no determinations of the butter yields were made until several days after the food had been changed. The milk was generally allowed to stand forty-eight hours to ripen or "lapper" before being churned, the lapping-dishes being earthen-glazed jelly-mugs, holding easily 2 lb. of milk. A tin measure was used for weighing the milk, the weight of the measure being counterbalanced, milk being gently poured in till the scales turned, after which it was emptied into the lapping-mugs. During the process of ripening, these were kept under lock and key in a dry press in the kitchen, where a uniform heat was constantly kept up, and ripening proceeded regularly and steadily. Owing to the small quantity of milk used, considerable care was exercised in thoroughly transferring all the milk from the lapping-mugs to the churns, and great precautions were taken to collect every atom of butter yielded by each, while the smallest weight used was half a scruple. The food used consisted of about 10 lb. badly saved hay, 6 lb. pea and rye meal mixed, 1 lb. linseed-cake, $\frac{1}{8}$ bushel grains, and about 10 lb. of silage made from the second crop of Italian grass. The meal which was to be steamed or cooked was mixed with the grains in a tub, over this boiling water was poured, the whole being covered with a piece of thick sacking (four-ply) in order to keep in the heat and steam. When the tubs were emptied for the one meal, they were soon after filled for the next. The meal in both cases was weighed before being used. If the number of cows to be fed had been larger, the meal would have had a jet of steam turned into it; but owing to the small number (four) the course followed was thought to be quite sufficient. Where the meal was given raw it was mixed with the food immediately before being served. Care was taken to have both lots served as nearly as possible at the one temperature.

For the first ten days all the cows were fed alike, the milk of each being weighed morning and evening. The animals were then divided into two lots, so that the amount of milk given by each lot for a week should be as nearly as possible the same. It was found that for a week the one lot of four cows had yielded 787 lb. of milk, while the other gave 788 lb. These figures are both a little less than the same cows gave for the next three weeks, which I presume is accounted for by their getting a little more meal when it was weighed, than when it was measured out for the whole herd.

Those which started on the steamed meal were kept on it for four weeks. They were then changed to raw meal, and kept on it for five weeks; then they were put on the cooked meal for two weeks, and after that on the raw meal for other two

weeks. In this manner individual peculiarities of the cows are in great part got rid of; also any difference which may have existed between the two lots of animals. All the food was the same, except that the one lot of meal was steamed, the other raw. All the animals being stalled in one small byre holding eight, they were under the same conditions as regards temperature, &c. In setting aside the milk for testing the percentage of cream or proportion of butter, both vessels were invariably kept side by side, so that any influences which might affect the one would also similarly affect the other. The churning of both lots was also always done at the same time and at the same temperature, so that no disturbing influences might be allowed to exert themselves.

During the experiment all the cows remained healthy, and gave a very regular quantity of milk, showing very little advantage for either class of feeding. During the second period of five weeks, however, it was quite evident that the cows getting steamed food were giving a milk which almost invariably yielded butter of a soft nature and whitish colour. On the feeding being shifted, it was found that the soft and white butter did not follow the food, but belonged to the cows. On the next shift being made, the white colour of the butter still stuck to the same lot of cows, so that it was definitely proved that the feeding had nothing to do with it.

FIRST PERIOD.—MILK YIELDED BY EIGHT COWS, ONE-HALF OF WHICH WERE FED ON STEAMED MEAL, THE OTHER ON THE SAME MEAL RAW.

Cow's No.	Trial Week, average of ten days.	1st Week.	2d Week.	3d Week.	4th Week.	Totals of four Weeks.	
1	194.5	209.	200.	207.5	200.	816.5	Cooked.
2	214.5	218.	210.	202.	199.	829.	
3	204.5	209.	229.	224.	213.5	875.5	
4	173.5	180.	187.	186.5	175.	728.5	
Total	787.	816.	826.	820.	787.5	3249.5	
5	175.5	177.5	193.	189.	171.	730.5	Raw.
6	212.5	238.5	252.	233.	213.	936.5	
7	158.	150.	152.5	153.5	146.	602.	
8	242.	235.5	259.	270.	249.	1013.5	
Total	788.	801.5	856.5	845.5	779.	3282.5	Gain 33. Raw.

It will be noticed that when the experiment began both lots of cows were milking as nearly the same as they could almost

possibly be, there being only 1 lb. of milk of difference on four cows over a whole week, the average of that week being calculated from the yield of ten days. With the exception of cow No. 7, almost all the others gave fully more milk during the succeeding weeks than during the trial one. How cow No. 7 should have continued to decrease and the others to increase, I have no idea, as she appeared quite healthy and was always ready for her food.

At the end of the first four weeks, the cows which had been getting raw meal were supplied with the cooked food, while those which had been getting cooked meal had raw food given them. The results of the following five weeks' feeding were as follows:—

SECOND PERIOD.—MILK YIELDED BY EIGHT COWS, ONE-HALF OF WHICH WERE FED ON STEAMED MEAL, THE OTHER ON THE SAME MEAL RAW.

Cow's No.	5th Week.	6th Week.	7th Week.	8th Week.	9th Week.	Total of five Weeks.	
1	196.5	205.	195.	201.5	191.5	989.5	Raw.
2	184.5	146.5	134.	142.	126.	733.	
3	205.5	203.	205.5	200.	188.	1002.	
4	159.	161.5	159.	151.	146.	776.5	
Total	745.5	716.	693.5	694.5	651.5	3501.	
5	167.5	153.	151.	151.5	152.	775.	Cooked.
6	209.	209.5	218.5	212.	204.5	1053.5	
7	150.	151.	139.5	150.	143.	733.5	
8	225.5	243.5	219.5	228.	211.5	1128.	
Total	752.	757.	728.5	741.5	711.	3690.	Gain 189. Cooked.

It is very apparent how quickly cow No. 2 dropped in her milk, having fallen in nine weeks from 218 lb. per week to 126 lb. of milk. Cow No. 7, which during the first month was the only one to give less during the experiment than when on trial, has fallen off very little during the last five weeks.

For the nine weeks the experiment stands thus:—

	Cooked meal. lb.	Raw meal. lb.
4 weeks' total yield	3249.5	3282.5
5 " " 	3690.	3501.
Balance in favour of cooked meal .	—	166.
	6939.5	6939.5

The cows were now again changed, being put back to the

class of food on which they had started, and the experiment continued for two weeks.

Up to the present the gain per cow per day in favour of cooking was .6 lb. of milk.

THIRD PERIOD.

FOURTH PERIOD.

Cow's No.	10th Week.	11th Week.	Total of two Weeks.		12th Week.	13th Week.	Total of two Weeks.	
1	180.5	182.	362.5	Cooked.	174.5	156.	330.5	Raw.
2	125.5	111.5	237.		101.	92.	193.	
3	188.	189.5	377.5		194.	176.	370.	
4	166.	142.5	308.5		135.	138.	273.	
Total	660.	625.5	1285.5		604.5	562.	1166.5	
5	140.	139.5	279.5	Raw.	135.	135.5	270.5	Cooked.
6	189.	182.	371.		180.	172.	352.	
7	139.	135.5	274.5		126.	126.	252.	
8	206.	193.5	399.5		197.	205.	402.	
Total	674.	650.5	1324.5	Gain 39. Raw.	638.	638.5	1276.5	Gain 100. Cooked

For the thirteen weeks the experiment stands thus:—

		Cooked meal. lb.	Raw meal. lb.
4 weeks' total yield of milk	.	3249.5	3282.5
5 " "	.	3690.	3501.
2 " "	.	1285.5	1324.5
2 " "	.	1276.5	1166.5
Gain by cooking	.	—	227.
		9501.5	9501.5

For the whole thirteen weeks the daily gain in milk of the four cows fed on cooked meal is .6 lb. (fully $\frac{1}{2}$ lb.) milk each, over those getting the same meal raw. The daily gain is not much—in fact, is probably much less than many persons would expect; but as the experiment was carried out without hitch or hindrance, I expect the gain is likely to be very near the actual facts.

Although a very large number of trials were made with the cream-gauges, no difference was shown to exist between the two classes of milk, the total averages of both being exactly the same. At times, however, the percentage of cream varied considerably, it going from 11 per cent up to 16 per cent. Both cream-gauges, as a rule, recorded very much the same percentage of cream, the samples being taken and the tubes filled when the milk was warm.

In experiments of this kind I have repeatedly weighed the animals weekly, but with milk-cows never could get any reliable facts from the weights; no weighings were therefore made in this case.

Four tests of the milk were usually made daily by the cream-tubes, except during a day or two after the food had been changed, but the total average for each lot of cows is exactly the same—viz., 12.2 per cent of cream—so that no information directly bearing on the experiment was derived from them.

The churning tests, although in themselves very interesting, did not reveal much of very great importance as far as the experiment itself was concerned. Taken over an average of fifty-two churnings, the two lots of cows yielded milk requiring the following quantities to make 1 lb. of butter. The milk from the cows getting cooked meal required 26.56 lb. of milk to produce 1 lb. of butter, while those getting raw meal required 26.51 lb. of milk to produce 1 lb. of butter.

The milk of each cow was tested individually to find out which cow or cows gave the white soft butter. Cows from No. 1 to No. 4 were found to give butter of a good grain and colour, and always firm, while every test which was made of the milk yielded by No. 6 gave butter bad in colour and texture. Another cow in this lot also gave butter scarcely so good in colour as the others; but the white colour of the butter of this lot of cows was in great part owing to the inferior quality of that yielded by cow No. 6, so that from this experiment it appears that one cow yielding butter of a very bad colour or texture, may lower the quality of that yielded by several others.

The smallest quantity of milk from individual cows required to make 1 lb. of butter was 20.3 lb., and the largest 32 lb.

CONCLUSIONS.

The conclusions to be drawn from this experiment are decidedly in favour of cooking meal; but the gain derivable from such, I fear, is less than most farmers give it credit for. Cooking the meal will not alter the percentage of the cream, nor will it change the quality or quantity of the butter.

I have also had sent me the proof-sheets of the results of several experiments which were carried on during the past winter in Norway, where one portion of the cows was supplied with cooked food and the other with uncooked. In almost every case these experiments show a very slight gain in favour of cooking, as far as quantity of milk is concerned; but as no determinations appear to have been made of the butter yielded by the milk from each method of feeding, these experiments are not of such great value as they might other-

wise have been. The results are, however, fairly confirmatory of those obtained by me.

I have just had sent me the results of an almost similar experiment on six milk-cows, carried out by Professor F. H. King of the Wisconsin Experimental Station, during eighty days of each spring of 1889 and 1890. Professor King used the same food to both lots of animals, but to one lot he gave ice-cold water, while the others had theirs heated to 70° Fahr. The results show only a very small gain to those getting warm water, and as such is contrary to the experience of dairymen generally, both experiments might profitably be repeated by those having the time and convenience for doing so.

THE PINE BEETLE (*HYLESINUS PINIPERDA* L.)

By W. SOMERVILLE, D.Cc., B.Sc., F.R.S.E.

THIS insect has been referred by various authors to the following genera: *Hylurgus*, *Blastophagus*, *Dermestes*, *Myelophilus*, *Myelophagus*.

DISTINGUISHING FEATURES.

Length about 1.5th of an inch. The body is very cylindrical. The elytra, in mature specimens, are almost black, in younger specimens brownish, and in those which have very recently emerged from the pupa stage they are light-brown. They are lustrous, slightly pubescent, and traversed longitudinally by rows of fine punctures. The interspaces between the punctated rows are somewhat wrinkled, and each contains a row of hairy tubercles. These tubercles, in the case of the second interspaces on either side of the middle suture, are only present as far as the point where the elytra begin to bend downwards towards the apex, whereas in the other interspaces they are continued down the apical declivity to the edge of the elytra (fig. 1). This peculiarity is most marked in the male, though in both sexes it is quite observable with the unaided eye when the insect is held in a good light with its back towards the observer—that is to say, when the apical declivity is examined obliquely. Owing to the want of hairy tubercles in the two interspaces mentioned, these are seen to be smooth and lustrous, and appear like shining lines or shallow grooves on the apical declivity. This point is of much

importance, for it is only by means of it that we can with certainty distinguish this insect from *Hylesinus minor*.

The pronotum (prothorax) is black in mature insects, and its length approximates very nearly to the breadth of the base.



Fig. 1.—*H. piniperda*, magnified about seven times.

It is beset with numerous shallow punctures, except in the middle, where they give place to a smooth somewhat indistinct line (fig. 1). The pronotum decreases in breadth from the base forwards, and just behind the head there is a slight though distinct transverse depression.

The head, which projects for only a very short distance in front of the pronotum, by which it is partly overlapped, is also black in fully developed beetles, and covered with small punctures. The eyes are oval in shape, and situated just behind the insertion of the base of the antennæ. Each of the latter consists of a long basal segment, followed by six small joints, of which the first is globose, and terminates in a club of four segments.

Each foot consists of 5 tarsi, of which the 3d is lobed, and embraces the 4th, which is so small as to be easily overlooked. Both the antennæ and the tarsi are of a rusty colour.

The larvæ are without feet and somewhat curved, but there are no special features by which either they or the pupæ can be distinguished from others of the same family.

GEOGRAPHICAL DISTRIBUTION.

The pine beetle is distributed over an exceedingly wide range of the earth's surface. It is found in every part of Europe, in Central Asia, and the whole of Siberia, in Japan, North America, Northern Africa, and the Canary Islands. In our own country it is exceedingly abundant, being certainly one of the commonest as it is one of the most destructive of insects.

LIFE HISTORY AND ECONOMIC IMPORTANCE.

The pine beetles pass the winter as perfect insects, for the most part in the thick bark which is more or less covered with moss or lichens at the base of old Scots pines, and especially in those trees which have been much infested by the insects during the previous autumn. For purposes of hibernation, the beetle either withdraws under the bark scales, or, as is oftener the case, bores a passage straight into the thick dry bark. As this passage pursues a radial course, and does not, as a rule,

penetrate so far as the living cortex, little if any damage is done to the tree.¹

While the majority hibernate in the bark of the stem at the part known as the "collar," many pine beetles pass the winter in the bark of those roots which appear above the surface of the ground, but which are partially covered by leaves, grass, &c. Some also pass the winter in galleries in the bark, at a distance of several feet from the ground,² a few in the young shoots that have been attacked during summer and strewn upon the ground by the autumn wind, and a few in the centre of young shoots that have remained attached to the tree.³

Towards the end of March—a little earlier or later, according to the character of the season—the beetles withdraw from their winter quarters and immediately proceed in search of material in which to breed. So long as the proper conditions can be fulfilled, great discrimination and fastidiousness are displayed in the choice of a breeding-place; but as the deposition of the eggs is a matter that cannot long be delayed, it not infrequently happens that oviposition is performed in somewhat unexpected situations. The material which is preferred consists of Scots pines that have been felled during the previous winter, or such as have been killed by fire or fungi, overthrown by wind, or broken down by snow. The fresh stools or stumps are also much sought after; but trees that are dry and partially decayed, as well as those which are in good health, are, under ordinary circumstances, scrupulously avoided. Thick-barked trees are much preferred to those with thin bark,

¹ Doubts are cast on this view by Taschenberg, although he does not actually oppose it. (See *Einführung in die Insekten-kunde*, vol. ii. p. 207.) Altum believes that at this time no damage whatever is done. (See *Forstzoologie*, 2d ed., vol. iii. p. 258; and *Waldbeschädigungen durch Thiere*, p. 193.) In proof of this he adduces the facts that the material thrown out in the excavation of these galleries is brown, showing that no living tissues have been pierced, and that he has never observed any resinous outflow from these wounds during the ensuing summer. Hess is of opinion that considerable damage is done to trees by pine beetles during the formation of their winter quarters. (See *Der Forstschutz*, 2d ed., vol. i. p. 317.) Judeich and Nitsche believe that where the beetles hibernate in comparatively young trees, they may ultimately bring about their death. (See *Lehrbuch der mitteleurop. Forstinsektenkunde*, 8th ed., p. 469.) Ratzeburg is of opinion that, when excessively numerous, considerable damage may be done by the galleries in which the insects pass the winter. (See *Die Forst-insekten*, part i., p. 175.) Eichhoff, the greatest authority on the Scolytidæ, has no hesitation in saying that hibernation-galleries do no harm whatever to the tree. (See *Die Europäischen Borkenkäfer*, p. 107.) Henschel is of the same opinion. (See *Leitfaden zur Bestimmung der schädlichen Forst und Obstbaum Insekten*, 2d ed., p. 93.)

² Taschenberg (*op. cit.*) seems to be the only observer who has recorded this fact. I have on several occasions made the same observation.

³ Strange to say, some of the best entomologists will not allow that this is the case. Taschenberg, for instance, says that the beetle has never been found in winter in such a situation (*op. cit.*, p. 207). In Scotland hibernation in such places is by no means rare.

so that old trees are more in request than young trees, and the lower part of a stem than the upper.

Although the food-plant of the pine beetle is pre-eminently the Scots pine, still it has been known to attack many other kinds of trees. It has been found more or less frequently on almost every other species of pine, on the Norway spruce,¹ and, in two instances, on the larch. The first of these is recorded by Middendorff,² who, when travelling in Siberia in 70° N. lat., found a great number of larches infested by pine beetles. The other case occurred in my own experience in Lanarkshire, where in the summer of 1890 I found several of these trees occupied by the galleries of this insect.³ I do not think the explanation of these irregularities need be a difficult one. So long as the insect confines itself to the genus *Pinus*, it is merely following its natural instincts. Possibly it prefers *P. sylvestris* to any other species; but its occurrence in vast numbers on *P. maritima* and *P. strobus* proves that these trees are also very suitable food-plants, and indeed are probably quite as attractive to the insects as the Scots pine. When, however, it is found on trees belonging to the genera *Picea* or *Larix*, the case is entirely altered. It is found on such trees so seldom, that it is evident there must exist a very strong reason to account for its presence there. The impelling force I believe to be no other than dire necessity. So long as suitable pines can be obtained, so long will these be utilised for oviposition; but should all such trees be occupied, or should none be present, then any kind of material that is in any way suitable must be made use of. Now it is not difficult to see when such a case might occur. During the early part of last decade Scotland was visited by a series of gales of exceptional severity which overturned great numbers of all kinds of trees, including Scots pines. These dead and dying pines furnished an enormous quantity of the material most suitable of all for the oviposition of pine beetles, which consequently increased in numbers at an almost inconceivable rate.⁴ Owing to the glutted state of the markets, and to the want of labour, these blown-down trees were in many cases allowed to remain in the woods for several years, with the result that the country was perfectly overrun by an army of pine beetles. When, however, the fallen trees were at last

¹ Eichhoff will hardly admit the accuracy of the reports of its occurrence on the spruce, but these seem too well authenticated to admit of reasonable doubt.

² Sibirische Reisen, vol. iv. pt. i. p. 608.

³ Somerville, "*Larix europæa* as a breeding-place for *Hylesinus piniperda*."—Proc. Roy. Soc. Ed., vol. xvii. p. 255.

⁴ Assuming a double annual generation, a single pair of beetles can in two years increase to many millions, and 100,000 young beetles may be produced in a single large Scots pine.—See Somerville, "How to Combat the Attack of Injurious Forest Insects" (Trans. Roy. Scot. Arb. Soc., 1890, p. 8).

cleared away, the insect found itself unable in all cases to obtain the right kinds of trees in which to breed, so that it was compelled to have recourse to the larch—a tree which, under ordinary circumstances, is quite secure from attack.

Leaving out of account the exceptional cases referred to, the pine beetles, after forsaking their winter quarters, are for the most part to be found on the stems of those Scots pines which have been felled during the previous winter. If the weather be suitable, preparations for breeding are at once made by the female commencing to bore a gallery into the bark in which to lay her eggs. As the entrance to this gallery is generally in a fissure of the bark, or underneath a semi-detached bark-scale, a tree may be much attacked without showing many external signs. As the work proceeds, however, the material excavated in the formation of the galleries is thrown out in the form of dust, and this, adhering to the tree or falling on the ground, indicates the presence of the insect. When the female has bored into the bark for a quarter of an inch or so, she returns to the outside, where copulation takes place, and this act having been accomplished, she again enters the gallery, this time closely followed by the male. About four days afterwards oviposition begins and is continued for from three to five weeks, the eggs, numbering from 80 to 120, being deposited in minute niches on either side of the mother-gallery. During this time the work of excavation is continually being proceeded with, and when completed, the main gallery has a length of from 3 to 4 inches, or even more. If the weather be dull and cold, the sunny side of the tree is attacked, but if warm, with much sunshine, the insects escape from the excessive heat by working on the north side of standing trees, and on the underside of those that are felled.

The mother-gallery has a very constant and exceedingly characteristic shape—so much so, indeed, that it can hardly be confounded with the work of any other insect (fig. 2). When the female beetle bores into the bark, she does not direct her gallery straight for the wood, but

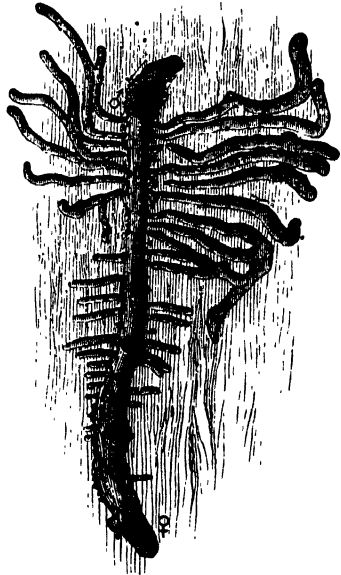


Fig. 2.—Bast side of bark, showing mother and larval galleries in process of formation. Nat. size.

always pierces the bark more or less obliquely, and when the wood is reached she changes her course so as to make an obtuse angle with the first direction. The rest of the gallery is nearly straight—unless some obstacle comes in the way—and almost always runs parallel with the axis of the stem. It will thus be seen that, when completed, the shape of the whole bears a pretty close resemblance to that of a golf-club, especially if we imagine the head of the latter to be rather more bent out than is usual. In the roof of the gallery there are usually from one to three air-holes—occasionally even four—which, however, are hardly distinguishable from the outside of the tree (fig. 2).

When a standing tree is attacked the crooked part of the gallery is uppermost, and the same is the case on a prostrate stem, provided the thin end is somewhat higher than the thick. If, however, the reverse be the case, then the position of the gallery will also be reversed, and if the tree be lying perfectly horizontal, some of the galleries will run in one direction and some in another. It will thus be seen that in forming the galleries the beetles always work down from a higher to a lower level. Although the mother-gallery is always in immediate contact with the wood, the latter is by no means deeply marked.

Ten to twenty days after the eggs have been laid the larvæ appear and proceed to eat their way into the bast more or less at right angles to the mother-gallery (fig. 2). The eggs that have been first laid are, of course, those which are first hatched; and as the time occupied in oviposition may extend to five weeks, it is evident that some larval galleries must be considerably developed before others have made much, if any, progress (fig. 2). Although situated very close to each other, the galleries made by the larvæ of the same brood do not interfere much with each other, though this frequently occurs between galleries of adjoining broods. For the first part of their course they run nearly parallel, but as they get farther from the mother-gallery they become rather tortuous, and one gallery may bend round the end of another.

At first the larval galleries are of almost thread-like fineness, but, as the grubs increase in size, the passages which they make become correspondingly wider, though they never actually attain the dimensions of the mother-gallery. For the greater part of their length the larval galleries, like the mother-gallery, are in contact with the surface of the wood, which, however, they do not break, but afterwards they lie wholly within the bast, and the pupal stage is passed within a small chamber situated close to the surface of the bark. It is to secure space for the pupal chamber that thick-barked trees are preferred to those with thin bark at the time when oviposition is performed,

though the power which the insects possess of adapting themselves to circumstances is sufficient to enable them to use thin-barked trees should the necessity arise. In such a case, the pupal chambers may not only be in contact with the wood, but may actually form depressions in it.

In order to escape from the pupal chamber the perfect insect bores a small hole to the outside of the bark, and as the flight-holes are not concealed in any way, and are usually very numerous, a glance at the exterior of a tree is sufficient to determine whether the new generation has escaped or not.

In an ordinary season the young pine beetles make their appearance about the latter half of June, those which are born early proceeding to breed, whereby a second generation is produced towards the end of August or in September; but those which do not make their appearance till July or later do not breed in the same year. The weather and the situation have much to do with thus modifying the natural habits of the insect. Where these are favourable, two generations in a year are of far more frequent occurrence than under opposite conditions. Even within a space of a few square yards the conditions may be so varied as to determine whether the generation shall be single or double. Thus I have frequently found that in the beginning of July all the young beetles had escaped from trees lying in a warm sunny situation, whereas in trees close at hand, but within the shade of a dense wood, the larval stage had not been passed. In the former case, therefore, the conditions favoured a double generation; in the latter, they almost or altogether precluded it.

Over the question as to whether *H. piniperda* has a single or a double annual generation, there has been fought one of the hottest battles in the whole history of economic entomology. Without entering at any length upon a discussion of the question, it may be mentioned that all the old entomologists, including Ratzeburg, accepted the single generation theory without question, whereas those entomologists who have worked at the matter in recent years aver that if a double generation is not the rule, it is, at all events, of very frequent occurrence. Some even go the length of maintaining that a third generation is not uncommon; but this view has not met with much support. From observations and experiments which I have made, I am fully convinced that in Scotland the occurrence of two generations in the same year is common. During the summer of 1890, I caused Scots pines to be felled at intervals of a month, and found that even so late as August these were being made use of by pine beetles for breeding purposes. Such insects could be no other than those which were hatched earlier in the season; that is to say, they were the offspring of the beetles

which hibernated during the foregoing winter, and bred in the early part of the summer. It seems quite impossible to suppose that they themselves existed during the previous winter, and did not awake from their winter's sleep till the end of July or even later in certain cases. My observations were made in a backward district, at an elevation of some 800 feet above the sea-level; and if a double generation is common in such a place, it seems reasonable to suppose that it must be of much more frequent occurrence in a low-lying, warm, and early district.

When the young beetles of the second generation (or those of the first which do not intend to breed in the same year as that in which they are produced) are fully formed, they leave their birthplaces, and, for the most part, betake themselves to the young shoots of the Scots pine. Those beetles which appear comparatively early, generally attack the shoot formed during the previous year, into which they bore from 1 to 2 inches beneath its apex. The gallery thus made extends upwards through the pith, and is usually continued into the youngest shoot, which ultimately withers and droops. At the time when the early beetles appear the youngest shoot

is too full of sap, or too thin and tender, to be conveniently excavated; and though frequently attacked, it is generally pierced only by a transverse aperture, not by a longitudinal gallery. The former is doubtless the entrance to what was intended for a gallery in the pith, but the resinous exudations evidently interfere so much with the work that the shoot is soon deserted for one more suitable. The injury, however, is as a rule sufficient to prove fatal; and young pine shoots, whose upper parts are seen to die in July, but which are only marked by a small scar about the middle, are almost invariably the victims of the attack of this insect.

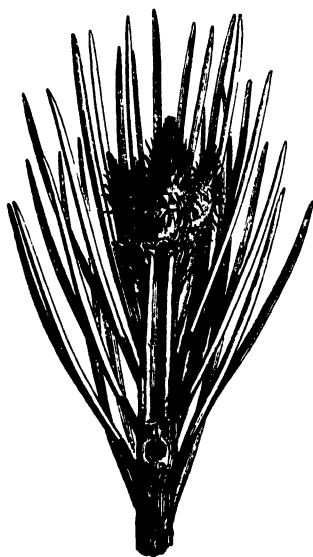


Fig. 3.—Shoot of Scots pine, with a slice removed, showing the excavation caused by a pine beetle. Two-thirds nat. size.

Pine beetles that appear late in summer or in autumn usually attack the youngest shoot an inch or two behind the terminal bud

(fig. 3). On account of the injury resin exudes from the shoot, and, consolidating into a funnel-shaped mass round the edge of the entrance-hole, indicates the presence of the insect. If

the passage does not extend up into the bud, growth in length may go on in the following summer much as usual, though the part of the shoot in which the beetle was at work generally swells into a spherical or oval projection. Where, however, the terminal bud is injured, as is generally the case, it does not unfold at all during the following summer, or it develops only partially, and is incapable of remaining the leading shoot of the tree. In these cases the place of the leading shoot is taken by a lateral bud, or by a side branch. A very interesting result of the suppression of the leading shoot is often to be seen in the development of small buds between each pair of needles. These buds are in no sense adventitious buds, being merely the dormant eyes of dwarf shoots stimulated into development by the injury to or removal of the normal shoot. The leaves produced on these peculiar shoots are much shorter and more bristle-like than ordinary leaves.

It has already been mentioned that pine beetles are occasionally found in shoots during winter; and as has just been pointed out, they are very abundant in such places from the end of June onwards, but I have also found them in shoots in the months of April and May. Eichhoff has never made this observation—which, however, is recorded by several other observers—and manifests great astonishment at the fact that Doebner should express the belief that it is by no means uncommon. Eichhoff says, "Perhaps these were bachelors who could not find mates." If this be the correct explanation—and for want of a better, it may in the meantime be accepted—the male sex in Scotland must predominate considerably amongst pine beetles.

Passages are bored into young shoots by pine beetles solely for the purpose of obtaining food, for no case of oviposition has ever been known to occur in such places. The same holds true with regard to long tortuous passages which the beetle often makes underneath the bark of young pines in August and September. Trees, for instance, which have been transplanted when four or five feet high, are very liable to be attacked in this way, and if not killed outright they are at least much crippled by the injuries which they sustain.

The young shoots of pines of a less age than eight or ten years are not often injured by the pine beetle, but above this age no trees are safe from attack. When from fifteen to thirty years old, trees are most liable to lose their leading shoots and to be transformed into misshapen stems, so that the damage done at this time is most apparent, and perhaps, on the whole, greatest. It not infrequently happens that in the neighbourhood of a sawmill, or other place where the insects are bred in great abundance, the trees are so infested year

after year that very few young shoots escape attack, and consequently such trees are ultimately killed.

In old pines the young shoots are comparatively thin, and therefore, when weakened by the boring of the insect, are easily broken off by the wind. In winter the ground underneath old trees that are much infested is often found to be covered by small branches which have been broken off by the autumn gales after being enfeebled by *H. piniperda*. The same trees being attacked year after year, in process of time lose their natural shape and assume quite a different appearance. Instead of the rounded outline and dense green foliage which are so characteristic of the crown of a healthy middle-aged or old Scots pine, the foliage becomes scanty and tufty, the dead ends of branches protrude in all directions, and the general form of the crown becomes somewhat conical. These symptoms enable one with the utmost certainty to distinguish trees even at a considerable distance that are infested with pine beetles, and induced Linné to call the insect *Hortulanus naturæ* (nature's gardener), and the German foresters to give it the name of *der Waldgärtner* (the wood gardener).

The damage done to old trees—where height-growth is practically over—chiefly takes three forms. 1. The loss of foliage affects the vital powers of the tree, bringing about a diminution in the annual production of wood, and predisposing it to the attacks of other insects as well as fungi. On this account *H. piniperda* is the forerunner of a great number of diseases affecting pines. 2. The loss of foliage means exposure of the surface of the ground, with all the accompanying evils consequent on accelerated decay of the forest-humus and over-rapid evaporation of soil-moisture. Lightening of the wood in this way also encourages the rank growth of grass and other weeds, and this renders natural renewal almost impossible. 3. The injury done to the young shoots interferes very seriously with the production of cones, a matter of no little importance where natural regeneration is practised or where Scots pine seed is gathered for sale or home consumption.

The trees which occupy an isolated or semi-isolated situation are most liable to attack, while those standing in close woods are for the most part spared. Thus it happens that trees growing in parks, hedgerows, or near the edge of woods, suffer most, and if such trees should chance to be situated near a sawmill or other place where timber is stored, and therefore where pine beetles are bred in large numbers, they are, of course, special victims.

Towards the end of autumn, on the approach of cold weather, most of the beetles begin to desert the young shoots and prepare for hibernation. Those which are still in the shoots attached

to the trees either leave by the same hole as that which was made on entering, or they effect an exit a little higher up. The former case is by far the more common, indeed shoots pierced by two holes are rather rare. At this time the beetles either cannot or will not use their wings, so that whether they are in shoots on the tree, or in those which are strewn on the ground, they invariably proceed to their winter quarters on foot.

PREVENTIVE MEASURES.

If moderate care be bestowed upon the management of woods the increase of pine beetles may be easily checked, and their numbers very materially reduced. In the absence of large "blow-downs" the insects increase chiefly owing to the careless way in which timber is often managed. It is not at all unusual to find that the trees felled during winter are left in the wood or its neighbourhood till far into summer. Each Scots pine that is so left attracts hundreds of pine beetles, besides other noxious insects, and in the months of June and July sends forth thousands upon their work of destruction. Even in woods that are regarded as being well managed this state of things may be seen, and the whole might be almost as easily prevented as permitted. When a timber sale is held in spring the buyer is often allowed his own time to lift the wood, provided he has paid for it, whereas he ought to be bound to have it removed not later than the 15th of June, or, otherwise, to cause it to be peeled before that date. The same applies to timber designed for estate-work. It is, of course, not enough simply to cart the wood to the sawmill and there allow it to lie. Such a course would do nothing to reduce the number of pine beetles. It must either be peeled or cut up, and in the latter case the slabs should be burned or peeled. If it can be managed, it is well to delay stripping the bark till near the middle of June, for there is but little danger of the young beetles escaping before that time, and by so doing time will be allowed for a larger number of beetles to utilise the trees for breeding purposes, and thus they and their larvæ can be destroyed in much greater numbers.

Trees should be cut as close to the ground as possible, so that the minimum of stool-wood may be left on which the beetles can oviposit. The practice of trenching out the stools is very effective in keeping the insects in check; but on account of the attendant expenses, it cannot be recommended unless a market can be found for the wood so obtained. On a steep slope or on rough ground it is quite impossible to cut so low as to avoid leaving high stools, and in such cases the bark should be as carefully removed as is practicable. In all

cases where peeling is done, the bark should be burned. If it contained only eggs or larvæ this would not be necessary, for these are situated close to the wood, and consequently perish when exposed to the influence of sun and air; but as pupæ may be present, and as these, in the case of thick-barked trees, are buried deep in the bark, they are still capable of developing into perfect insects even after the bark has been separated from the tree.

The woods should be carefully supervised in all their stages, and trees which are diseased, enfeebled, overcrowded, or just dead, should be at once felled and removed or peeled. It cannot be too strongly insisted upon that pine beetles are in no way kept in check by cutting down trees which have been dead for many months, and clearing them out of the wood. It is not in such trees that the beetles find the means of increasing, though they have already served this purpose. The object of the forester should be to anticipate the death of a tree, and have it removed before it is actually in a fit state to be appropriated by the insects.

Birds and mammals that prey upon insects should be preserved, and encouraged to increase. Gold-crested wrens, tree-creepers, and titmice are deadly enemies of pine beetles, as indeed they are of all small insects. Much may be done to bring about the increase of titmice by erecting suitable nesting-boxes on trees, care being taken that the hole into the box is not so large as to admit sparrows, that the boxes are fastened to dense-crowned trees, such as spruces, at a height not exceeding 10 feet from the ground, and that each box is secured to a separate tree.

ERADICATION MEASURES.

The most important eradication measure consists in felling what are called "catch-trees," which attract the pine beetles for breeding purposes; and when this has been accomplished, the trees are peeled and the bark burned. The trees which are selected for this purpose may be those which are destined for removal in ordinary course, or such as are badly formed, unhealthy, damaged, or overgrown by taller trees. Those trees which are chosen should be felled at intervals of a month during the breeding season, the first being prepared in the middle of March, and the last in the middle of August. After lying for eight weeks, they must be peeled and the bark burned. The number of trees required will depend on their size, the abundance of the beetles, and the extent of the woodlands. It is not difficult to determine this point, for if it be found that the mother-galleries are much crowded under the bark, then too

few catch-trees have been felled; but if the mother-galleries are separated from each other by 10 or 12 inches, a sufficient quantity of breeding material has been prepared. As pine beetles prefer thick-barked trees in which to breed, it is advantageous, though not absolutely necessary, to select as catch-trees such as are at least forty years old. By means of these lures many other pine-destroying insects may be greatly reduced in numbers, such as *Hylastes palliatus*, *Tomicus acuminatus*, *Hylobius abietis*, and, in fact, all the bark-beetles and weevils that prey on pines.

As has been indicated, a preventive measure may be so modified as to become eradivative in its action. This is the case where felled timber is not removed from the wood at once, but is left for the express purpose of attracting the beetles so that they may afterwards be conveniently destroyed. The same is true with regard to dying trees and trees that have been blown down.

Except the preparation of catch-trees in one or other of the ways indicated, no eradivative measure has met with much success. It has been suggested, and the suggestion has been acted upon, to collect and burn the young shoots which, owing to the injuries caused by the pine beetle, have fallen from the trees in autumn; but as the great majority of these broken shoots are tenantless, the plan has not been found to yield good results. Better success is said to attend the practice of smearing with tar the thick bark at the base of old trees which are seen to be much used for hibernation purposes. This is done during winter or early spring, the result being that the beetles, being imprisoned in their winter-quarters, are prevented breeding.

POULTRY FARMING.

By ERNEST W. G. GOVAN, Glengyle, Perthshire.

FOREIGN IMPORTS.

"WEST HARTLEPOOL is one of the chief ports for the egg trade. In the past week no fewer than six hundred tons of eggs were landed there in four days. This represents probably more than nine millions of eggs—over two and a quarter millions daily. It is an enormous trade for one port, and the fact should cause dairymen and farmers in this country to consider whether it cannot be partially kept at home." By quoting the

above paragraph, which appeared in one of the leading trade journals of this country, I place the position of the egg industry in a very practical and forcible way before my readers. This instance of the immense Continental trade at West Hartlepool is only an exaggerated illustration of the trade which is being continually carried on through many other ports of the United Kingdom.

NEGLECT OF POULTRY CULTURE.

During recent years, when progression has been the watch-word in all or nearly all branches of agriculture, it has seemed to me perfectly incredible that our domestic poultry have not received the attention which undoubtedly they deserve.

Without going very deeply into the question, the merest novice must see that the fact of this enormous foreign importation is a national disgrace. In this country fowls are considered beneath the farmer's notice! They will supply good shelter and good food for their sheep or pigs, but poultry are allowed to forage for themselves, and seek shelter from the raw cold of our British climate as best they can. Even in the days when Stephens, one of the highest authorities on all matters pertaining to agriculture and live stock, wrote his 'Book of the Farm,' the neglect of poultry was very evident; for does he not say, "Of all animals reared on a farm, none are so much neglected by the farmer, both as regards selection of their kind for fattening and laying purposes, and also as regards the food given to them, as every sort of domesticated fowl"? When this state of affairs is taken into consideration, no wonder is it that we do not hear of profitable returns, and therefore of more attention being devoted to them. But poultry are no exception to the generality of live stock; such treatment as this will never bring in a remunerative return from any species, and poultry of all kinds require generous treatment before they will yield a generous return. In the face of this strange and unaccountable neglect in this country, it is a curious fact that poultry are the mainstay of a large portion of the peasantry of the Continental countries of Western Europe. The cause of this can be explained, however, when we remember that our Continental neighbours have devoted a great deal of attention and experiment to poultry-keeping in all its branches, with the natural result that the system upon which this industry is now worked is nearly perfected. That a system of the most practical kind is required must be evident to all, for the greatest drawback respecting the culture of poultry in rural and outlying districts is the difficulty of speedily conveying the produce to a favourable market. Towards the close of my report I will deal with the Continental system upon which the poultry

industry is worked, but would take this opportunity of remarking that reports may be written and articles published, but nothing will remedy the present deplorable state of affairs but a thoroughly practical commission appointed by Government to investigate and advise respecting the development of this industry in Great Britain and Ireland. We hear of a Fisheries Commission; but although fishing is an important industry, it is also so hazardous and uncertain that the judicious keeping of poultry throughout our Highlands and Islands would form a much more reliable means of livelihood than the harvests of the sea.

PRACTICAL INFORMATION FOUNDED ON ACTUAL EXPERIENCE.

I shall now proceed to deal with poultry and poultry-keeping in a plain and practical way, the information respecting the suitability of the different breeds for our climate, and also their productiveness, the many hints given on hatching, feeding, housing, &c., being the outcome of my own experience and experiment with the different varieties.

DIFFERENT BREEDS.

Before going on to consider the actual management of poultry, it will be well to devote our attention to the different breeds of our domestic fowls. First, let me point out that there is no variety so pre-eminently useful and suitable that it stands out very conspicuously. A great deal depends upon how such and such a variety has been treated, for the best will soon prove comparatively useless if continually inbred and weakened by injudicious treatment. But given judicious treatment and suitable mating, there are some breeds which take a superior rank as being particularly useful fowls for our country; and I shall now deal with those in what I consider the order of their merit. Let me mention, however, that in my opinion the laying breeds are much more valuable than those breeds that are famed for their table qualities. Then as to egg-production, we must not only take into consideration the quantity, but also the quality and size of eggs. As regards table virtues, we must have smallness of bone, whiteness of flesh, and delicacy of flavour. For this climate hardness is an essential in every breed. Appearance, also, is worthy of a little consideration, although, of course, it must be of little consequence if the utility capacities are not of the first rank.

Laying Breeds.

As egg-producers we have three breeds which take a very high rank. I speak of Minorcas, Leghorns, and Andalusians.

The Minorca.—First let us see how the Minorca stands as regards the characteristics already mentioned. Is the Minorca a prolific layer of large and well-flavoured eggs? I answer, Yes; and, as an egg-producer, is surpassed by no other variety. Roughly speaking, they will average 200 eggs per annum, and eggs of no ordinary size, for they weigh nearly 3 oz. each. Then as to the table qualities of the Minorca, although in this respect they do not equal some varieties, still they are not to be despised, as, combined with smallness of bone, their flesh is beautifully white and of delicate flavour. Their hardiness is unquestionable, for after several years' experience of the breed, I have found it a rare occurrence to lose any by disease. As chickens they will thrive in almost any kind of weather, foraging far and wide, and thus gaining the necessary exercise to produce health and hardiness. In appearance they are handsome, upstanding birds, with fine deep bodies. The plumage is pure black throughout in one variety, and pure white in the other, legs being of the same colour as the plumage. My preference rests with the black variety, as they have the advantage of never looking dirty. There are one or two characteristics of the Minorca which must not be forgotten. They are non-sitters—that is, they do not undertake maternal duties, the long-continued selection of breeding only for egg-production having almost entirely dispelled the instinct for sitting and brooding. It is an exceedingly rare thing for a Minorca ever to go broody. The result is, that while some of the more heavily feathered varieties are fevered with incubating aspirations—their egg-producing powers being for the time suspended—the Minorca is steadily and daily producing eggs. Another good point is that they mature early—that is, as chicks they feather rapidly, and as pullets they lay early. They are sprightly and active, and will find food where other birds would fail. As I have already hinted, however, a bird may have a good name and still be very useless. In choosing Minorcas, as well as any other variety, we must ascertain that their history is a good one. We must eschew the lank, leggy, small-bodied specimens, which, sad to say, are often seen, and choose fowls more of the Dorking shape, with medium length of leg, full breast, and deep bodies.

Leghorns.—All I have said eulogistic of the Minorca may be justly said of this excellent variety. They present very much the same characteristics as the Minorca. Although equalling in number, their eggs do not quite equal those of the Minorca in size. Leghorns are perhaps the most popular breed of all in the United States, and this very fact speaks well for their hardiness, as the winters in the northern States are very severe. This variety was also selected by the Royal Danish Poultry Society as being the most suitable breed for Denmark. There are several varieties, the white and the brown being most gen-

erally kept. The brown variety are supposed to lay a larger number of eggs than the white, but the latter lay the largest eggs. The white variety, however, are liable to a serious vice, feather-eating. This vice does not always break out in every flock, but in some cases when it does it will assume such proportions that nothing will cure it but the destruction of all those affected by it.

Andalusian.—This is a breed which has never won the position which its superior economic merits deserve. As layers Andalusians are among the best. They are also very hardy and suitable for a cold, high-lying district. In appearance they are of a peculiar blue colour, each feather being delicately laced with black. As chickens they are precocious and feather rapidly, while as adults they bear confinement very well.

“General Utility” Breeds.

Having singled out what I consider to be the three best egg-producing breeds, I shall now pass on to consider what I shall term “General Utility” breeds—varieties which, with excellent egg-producing capabilities, combine particularly good table qualities. For the two best of those we are indebted to the enterprise of our American cousins, for it was from their ingenuity that the varieties originated. I speak of those two very excellent breeds—Wyandottes and Plymouth Rocks.

Wyandottes and Plymouth Rocks.—In those breeds are combined, in as great a degree as possible, good egg-producing, brooding, and table properties, together with very special hardiness. For a good all-round fowl—a fowl that will well repay judicious attention—nothing can surpass either of those breeds. Provided a good strain be procured, it will be found that they are particularly good winter layers. In appearance the Wyandotte (see fig. 4, p. 48) takes the premier position, it being difficult to find a prettier fowl than the silver-laced variety. There are one or two other breeds well worthy of being classed as general-utility fowls.

Langshans.—About the best of those is the Langshan, which was first introduced into this country about fifteen years ago, and was brought from China. It is a splendid table fowl, the meat being beautifully white and of delicious flavour. They are excellent layers of rather small tinted eggs. They are thoroughly hardy and very docile. It is a breed which ought to be encouraged, as they lay particularly well during winter.

Table Fowls.

Now to consider several breeds which are more especially table fowls, and certainly stand out very conspicuously as brooders. In my opinion their chief drawback is this ever-recurring tendency to cluck, and I feel sure that were this disposition carefully

bred out, by hatching only the eggs of those which showed least inclination to go broody, we should soon vastly improve those heavily feathered varieties. Those remarks have reference to Dorkings,¹ Brahmas, and Cochins, all very excellent table fowls,



Fig. 4.—Pair of Wyandottes (silver-laced variety).

¹ Dorkings are unquestionably good table fowls, and a cross of Dorkings improves any barn-door fowl. Brahmas and Cochins are miserable birds for the table, and a cock of either breed will spoil a whole farmyard, — coarse legs, coarse bone, coarse skin, and, in proportion to the large coarse legs, shallow breasts.—EDITOR.

good winter layers, but only fair layers during spring and summer. They are all tolerably hardy (Brahmas being slightly delicate during chickenhood), and are well adapted for our climate.

Dorkings.—The great quality of the Dorking is in the merit of its flesh, which is of a peculiarly delicate colour, texture, and flavour. In order to sustain those specially good table characteristics, we must select birds which are large and square. In table fowls size should be a primary consideration. There are several varieties of the Dorking, all equally good. They must, however, have liberty and a dry soil; dampness and want of shelter are fatal to their success.

Brahmas.—The Brahma is also a very useful breed of the heavily feathered varieties. As an egg-producer, however, it has deteriorated of late years, too much attention having been bestowed upon its exhibition qualities. There are two varieties, the dark and light, both being tall and massive fowls.

Cochins.—As to Cochins, the day was when they were the most popular fowls in England. To-day, however, they are kept more for their appearance than for their economic properties. They are fair winter layers, but inveterate sitters; and even although they sit well, they never make successful mothers, because of their weight and awkwardness. In leaving those heavily feathered varieties, there is one special feature which must not be lost sight of—the facility with which they may be enclosed. A Leghorn or Minorca will think nothing of surmounting 8 or 10 feet of wire-netting, while 3 or 4 feet is sufficient to confine Brahmas or Cochins.

Suitable Breeds for this Climate.

There still remain a great many breeds to be disposed of, but I shall only deal with such of those as are well adapted for our climate. Several of them are very good useful breeds, others from one cause or other are not well suited for our country.

Scots Greys.—First on the list we have Scots Greys, which I might almost call our national fowl. There are many points in its favour. It is a very good layer, is exceedingly hardy, and the hens do not show too much disposition to undertake maternal duties.

Hamburgs.—Then we have Hamburgs, which are very prolific layers of small eggs. There are five varieties of the Hamburg, all very ornamental little fowls. They have close compact bodies, and are extremely active birds, not standing confinement well.

Spanish.—Perhaps the breed which produces the largest egg is the Spanish. No variety, however, has suffered so much from the breeder's art. In trying to produce a fine white face.

they have sacrificed the egg-producing properties as well as the hardiness of this fowl, with the result that to-day it is altogether too delicate for our climate.

Game fowls, on the other hand, have been bred so much for their fighting capabilities, that their economic powers have suffered. In some localities and under some circumstances they may prove useful.

Orpingtons, Houdans, and Indian Game.—With the mere mention of Orpingtons, Houdans, and Indian game the list closes.

I think we have in that category ample to choose from. I have treated of the different breeds as I have found them, and have given them what I consider their honest position.

Good Strain requisite.—Let me again emphasise, however, that there are strains and varieties, and in our selection the strain must receive nearly as much consideration as the breed.

Suitable Breeds.—In recommending a suitable breed for a particular part of the country, the first considerations are the characteristics of the land and the climate. The natural variations of soil, of climate, and of conditions, demand and induce variations, in so much that a fowl well adapted for the dry soil and sheltered situation of the southern midland districts of Scotland, such, for instance, as Peeblesshire, would be unsuitable for the bleak mountainous parts of our northern counties. There are other circumstances which should be taken into account other than the character of the country and the climate. In our Highlands and Islands, which have large hotels, and are annually overrun with visitors and tourists, there is always a very ready and favourable market for eggs during summer. It would be wise, therefore, to utilise the existing demand, and as hardy fowls are essential for this district, I would recommend such summer layers as Minorcas, Leghorns, or Andalusians. In the neighbourhood of large cities, however, where a ready sale, at exceedingly remunerative prices, may be had for eggs during winter, Wyandottes, Plymouth Rocks, Langshans, or, in short, any of those breeds which have special winter egg-producing properties, may prove most profitable. To revert to the Highlands, I might suggest the advisability of hatching early chickens of such varieties as have good table qualities, and forcing those on, when they would find a ready sale during summer or autumn.

Cross-breeds.—Then apart altogether from pure breeds, cross-bred fowls are often extremely useful, but never more than the first cross should be kept. Thus Minorcas mate advantageously with Langshans, Wyandottes, Brahmas or Indian game; any person, in fact, with ordinary ingenuity can suggest a mating likely to be productive of a useful fowl. With those remarks

respecting the different breeds, I shall pass on to consider the subject of houses and runs.

HOUSES AND RUNS.

From the small house and 5-foot run of the suburban poultry-keeper to the spacious and beautifully equipped buildings on many modern poultry farms, not forgetting the crofter's cottage with the fowls roosting in the rafters, and laying their eggs in the bed, there is an enormous diversity in houses, so much so, that it is absolutely impossible to give anything like complete plans or suggestions respecting the housing of poultry. There are many well-known firms, such as Spratts Patent, Boulton & Paul, &c., who make a specialty of poultry-houses, and their catalogues give innumerable plans to meet the length of every purse.

Essentials: Ventilation, Flooring, Light, Cleanliness.—There are several essentials, however, without which no poultry-house can be a success. We must have the building light, airy, and warm, but free from any damp or draught. It should be at least 8 feet in height, and should be ventilated with adjustable ventilators near the top in such a way that a draught is impossible. The best, cheapest, and most easily constructed flooring is made of riddled ashes well mixed with hot-lime. This should be laid on the ground about 2 inches thick and have some tar poured over the surface. It should then be allowed to stand for a day or two, when it will be found quite hard, and will form a nice smooth floor. Wooden houses are quite as satisfactory as those built of stone. The roof of the building must be perfectly water-tight, and may be simply covered with felt and tarred. As a rule, poultry-houses in this country are far too dark, which lends its aid towards dirtiness. In America it is a common thing for poultry-houses to have one side entirely of glass. Too much stress cannot be laid on the question of cleanliness, and to have cleanliness we must have light.

Situation.—As for the situation of the hen-house, this is a most important point. By all means get a sunny location. If a spot with a southerly exposure and a declivity just in front can be utilised, certainly build your hen-house there.

Sunlight beneficial.—There is nothing fowls revel in so much as sunlight. It is almost as essential to the success and health of our fowls as it is to the colour and beauty of our flowers. Let the fowls have the full blaze of the very moderate amount of our winter sunshine, and it will help wonderfully towards the supply of eggs in winter.

Roosting-perches.—The only internal fittings required in an ordinary hen-house are the laying-boxes and roosting-perches. The latter should not be above 3 feet from the ground. Flat

roosting-perches 3 or 4 inches broad, with the corners slightly rounded, are preferable to round perches. Birds, especially chickens, should not be allowed to roost on sharp-pointed or narrow perches, as those frequently lead to crooked breasts.

Laying-boxes.—The laying-box, which may be divided into nests each partitioned off, can be of any length required, and should be placed in the darkest corner of the house. The nests should be supplied in the proportion of one to each four hens.

Covered Shed.—Outside the poultry-house it is desirable to have a covered shed. About most farm-steadings there are usually plenty sheds or out-houses where poultry can take shelter on a stormy wet day. Where there is no accommodation of this sort, however, we must be careful to supply the want, as nothing is so injurious to fowls as a thorough wetting.

Dust-bath.—Under this shedding, in a sunny spot if possible, the dust-bath should be constructed. This may be made by cutting a trench in the ground, and filling it with peat or other ashes finely riddled. A little sulphur should be sprinkled into this dust-bath about once a-week. Poultry will often provide themselves with a dust-bath in some sunny spot at the base of a hedge or tree, and in such a case the artificial substitute is not required. At all events, see that they have one, as a chief hindrance to the success of our fowls is to have them overrun with lice or other injurious parasites. The most efficacious remedy for this is the dust-bath.

Grass Run.—Where poultry have not free scope to roam and forage, it is necessary to provide them with a grass run which should allow at least six square feet to each fowl.

Portable Houses.—Portable poultry-houses are also very excellent things. They can be removed from place to place according to the state of weather or time of year. It is a capital plan to put a flock of fowls from field to field immediately after the various crops have been harvested. The fallen grain is not therefore lost, but utilised for the poultry.

Washing with Lime.—However good our buildings may be, it is absolutely necessary that they should be kept scrupulously clean. The fowl-houses should be thoroughly swept out every day with a birch broom; the perches also should receive an energetic brushing. Two or three times a-year the interior of the houses should receive a complete washing with hot-lime and water, every crevice and corner being gone into. No fowl-house will ever have a bad smell if this mixture of quicklime and water is liberally used; and, apart from the fact that it is a great purifier and insecticide, the lime, as it slakes and hardens on the wall, forms a very useful and necessary food, and the

fowls will often be seen pecking at it. It is very beneficial to sprinkle the floor and perches occasionally with disinfectant powder—Jeye's, Calvert's, or Sanitas powder being best for this purpose. The straw in the laying-boxes should be entirely changed every week. A china egg, which should be kept clean, may be placed in each nest. Too much care cannot be devoted to the feeding and drinking dishes. Food must never be left lying about to become sour, and thus set up diarrhoea or some other troublesome ailment. Even water allowed to lie for any length of time becomes injurious. Err on the safe side, and rather lay down too little than too much for them to eat.

PARASITES.

If these precautions be attended to and systematically carried out, insects and parasites may not be feared—at any rate, they will never reach such a proportion that they will do our fowls any appreciable harm. When our fowls become seriously infested with them, they suffer so considerably as to render them entirely unprofitable. The food given to them goes to sustain those parasites, and not to produce eggs or form flesh.

From my remarks, therefore, respecting the housing of poultry, it will be seen that cleanliness and ventilation without draughts are the two essentials to success, and we must guard against any dampness either from above or below. Further on, under the heading of General Management, I shall deal with the question of whether or not we should supply heat to our houses during winter.

HATCHING.

We now go on to consider what is perhaps the most important subject connected with poultry-keeping. Upon the successful issue of our hatching operations depends in a large degree the subsequent profit of our poultry-keeping. To the unversed, who look upon hatching from a superficial point of view, it no doubt appears a very simple and uninteresting process. This, however, can also be said of nearly every process or study, although such study may become most engrossing and edifying to those who seek to unravel the mysteries and discover the secrets thereof. It is to me perfectly astounding, the almost universal ignorance which holds sway respecting this, one of the most interesting processes of the Almighty's creation. To satisfy myself on this point I have repeatedly asked the question—Is the chick formed from the yoke or white of the egg? and I can safely say that at least two out of three give an erroneous answer. Now until we can enliven the interest and extend the information respecting this im-

portant process, we need never look for first-rate returns from the culture of fowls.

Artificial Incubation.—In dealing with the subject of hatching, the first thing that claims our attention is the question of artificial incubation or hatching.

Artificial Machines not recommended for General Purposes.—In an abstract sense the hatching of chickens has of late years received a great deal of consideration, so much, in fact, that the ingenuity of man has devised an artificial machine to take the place of the sitting hen, keeping the same results in view. I need not say *a* machine, for the amount and variety of machines are quite innumerable. Not only have machines been invented to hatch the eggs, but man's ingenuity has also devised an artificial substitute for the mother, which goes under the name of the artificial mother and rearer. Now it is quite out of my province to enter at all fully into the subject of artificial incubation. I shall only remark, that while on very large poultry farms, where thousands of chickens are hatched every year, they are indispensable, to the average poultry-keeper they are altogether unsuitable, as the number of eggs at stake does not justify the amount of care and trouble required. The artificial mother also is not, nor can ever be made, a worthy substitute for the mother. No artificial machine can be invented which will forage for and protect the chicks in anything like as efficient a manner as the natural mother. That three or four hundred chicks can be produced every spring independently altogether of artificial means, I have proved in my own experience, as even amongst the cold bleak mountains of Perthshire seldom it was that I had not at least three hundred chickens well advanced and running hither and thither by the middle of May in each year. How this can be done will be fully explained later on under the heading of Economy of Hatching.

Broody Hen.—Now to consider the preliminaries of hatching, of which the most important is the broody hen. I have already mentioned the varieties which are pre-eminently sitting breeds; the lighter-feathered, egg-producing varieties seldom go broody. Apart from those sitting breeds, however, nearly every cross-bred fowl shows more or less of the incubating tendency, and experience leads me to think that the lighter clean-legged cross-bred fowls are the most suitable for hatching purposes. They may not, I admit, cover so many eggs; but once the chicks are out, it is a rare thing for any to be injured by being trampled upon. On the other hand, it is the exception for every chick to escape unhurt when large heavy Brahmas or Cochins are used. If we therefore decide to keep pure breeds of the laying varieties, we must also keep a few cross-bred or pure-bred

fowls of the sitting varieties for our hatching operations. The number of those fowls must be governed, of course, by the number of chickens we intend to hatch. When we consider that those fowls have to be fed for eight months out of the twelve, when they are unremunerative or nearly so, it behoves us to select capital and well-tried mothers which we can depend upon. When the plan is at all practicable, it is far better to buy "cluckers" in the spring; but this is only possible when we are located in a district which has a large rural population. In such a district cottars, as a rule, have considerable flocks of cross-bred fowls, and they are often glad to get half-a-crown for a sitting hen. But in many cases this scheme is impracticable, and we must fall back upon our own yards for our sitting hens. To keep up our stock of these, we can introduce one or two hens of a special sitting breed, such as Brahmas or Cochins. Mated with a Minorca cockerel, excellent sitting fowls would be obtained. The advantage which such a plan as this has over the one of keeping two distinct breeds—one for laying and one for sitting purposes—is that no separation is required. Brahmas and Cochins—in fact, nearly all sitting breeds—produce tinted eggs, which can easily be distinguished from the snow-white eggs of the Minorca, Andalusian, or in fact almost any of the laying breeds. There is also no reason why the female progeny of the Minorca-Brahma mating should not mix with our usual stock, as even *their* eggs can be easily distinguished. It is absolutely necessary that we should be able to distinguish the eggs if we want to sell the pure-bred eggs for hatching. Thus one house is sufficient, and wired-in enclosures unnecessary, when this plan is adopted. I may add that I have found such a scheme as this far the best upon which to keep a large flock of Minorcas.

Nests.—As regards the most suitable nest in which hatching operations are to take place, opinion varies much. When a good many chickens are going to be hatched, boxes 5 feet long by about 18 inches high may be used. Those are to be partitioned off into three parts, thus forming portions of 20" × 20" × 18". A grass turf about 6 inches thick must now be cut so as to fit *exactly* into each partition. The centre of each turf must be scooped out into the shape of a nest. This should be lined with straw, or better, dry grass. Some of my readers may ask the reason for having a turf. Will the damp and cold not chill the eggs, and thus endanger their fertility? I answer, Certainly not. If we want to achieve the highest success in the culture of poultry, we must look to nature and the natural habits of the fowl, and deduct lessons therefrom. Who has not known the domesticated fowl, after an absence of a few weeks, return from a neighbouring plantation followed

by a dozen chicks, or sometimes even more! She has achieved this success with her nest made on the cold earth, with possibly only a few leaves or straws to protect the eggs from the damp soil!

Moisture necessary.—A certain amount of moisture is positively necessary to the wellbeing of the eggs. Were this moisture withheld, the delicate white membrane within the shell of every egg would be baked into a parchment so strong, that the chick in its death-struggle would be unable to break through it. The object, therefore, of placing a turf in the hatching-box is to supply a certain degree of moisture during the period of incubation, which will prevent the occurrence of any disaster of this description.

Hatching-house.—The hatching-boxes must not be placed in the ordinary hen-house. Some quiet outhouse should be entirely devoted to this purpose. It should be comparatively warm, and must be kept scrupulously clean, so that no obnoxious smell can arise.

The Eggs to be set.—Now as to the eggs to be set. The number of those must be adapted to the season of the year, and to the size of the hen which is to cover them. In the early months it is wise never to set more than twelve eggs, however large the hen may be. With small hens eight, nine, or ten eggs may be ample. It is an over-zealousness which often produces fatal results that leads us to set too many eggs—more than the hen can securely cover. We must remember that a sitting hen is for ever changing the position of the eggs, the innermost one being shoved out, and *vice versa*: so that when too many eggs are given, there is always the possibility of several, if not all, being fatally chilled. Thus when we want to have good results from our hatching operations early in the year, the number of eggs set must be strictly limited, or we shall very probably be served like the monkey in the well-known fable, who had to go without any nuts at all!

Time of Hatching.—In ordinary circumstances, however, I do not approve of hatching chickens very early in the year. For all general purposes the period 15th March to 15th May is *the* hatching season of the year. Pullets hatched at this time will commence to lay about the beginning of November, and with ordinary weather and judicious management, will lay on during the whole winter when eggs are at their dearest. To a certain extent we are at the mercy of the fowls as to the exact time of hatching, for little can be done till they show signs of broodiness. Whenever I was in need of a brooder, I found it an excellent plan to leave half-a-dozen eggs in a nest in some conspicuous position. The sight of those seemed to stimulate the incubating instinct, and more than probably I would

find some hen firmly ensconced on the eggs within a day or two.

Number of Eggs to be set.—In distinct antagonism to the accepted theory, and in the face of popular superstition, let me say that it is quite unnecessary to set an *odd* number of eggs! However superstitious some of my readers may be, let me aver most positively that there is nothing in it. During the period before-mentioned we may set from twelve to fifteen eggs, according to the size of the hen. Those eggs should be as much of a size as possible, and we must avoid abnormally small or large eggs—medium-sized, rather round eggs are the best. Let them be perfectly clean when set, and kept clean during the period of incubation by sponging with warm water when necessary.

Treatment of Sitting Hen.—Upon the judicious treatment of the hen during this important period depends almost entirely the faithful sitting of the hen. Very often hens are grievously mismanaged at this time, the result being that they either go off their broodiness, or, if they sit their time out, they are in such a miserable condition physically that they are perfectly unable to protect and forage for the chicks in a satisfactory manner.

A Grain Diet.—The correct way to feed and manage hens during this period is so simple, that the mismanagement now prevailing is astonishing. The three essentials which are required for the perfect treatment of a sitting hen are these—grain, pure water, and a dust-bath. I have called them essentials, and so they are. No food of any description except grain, of which good sound wheat is the best, should be given. On no consideration should soft food be supplied, as that digests far too rapidly, and, apart from the fact that the hen will be hungry again in a very short time, it will probably be found that she has dirtied her nest before the hour of her daily vacation has come round.

Dust-bath necessary.—A dust-bath composed of the materials already mentioned is indispensable. Pure water must be supplied daily. Regularity in feeding must be strictly observed, the best time being about mid-day, when the air is warmest and the eggs have not so much chance of being chilled.

The door of the sitting-box being opened, if the hen does not come out of her own accord, she should be gently but boldly lifted off the nest and placed beside the food. In doing this, care must be taken that no eggs are drawn out of the nest and broken. In the usual course of events she will at once commence to eat and drink, and when satisfied will go over to the dust-bath there to engage in vigorous dust ablutions for several

minutes, after which she will almost invariably go back to the nest and settle down. If, however, she does not do this, she must be carefully lifted, gently placed on the nest, and the door shut.

Duration of Absence from Nest.—The correct time for a hen to remain off the nest varies very much according to the temperature of the atmosphere. If the air is warm she may be off for twenty minutes or half an hour, but in frosty weather seven to ten minutes is quite long enough.

While the hen is off, we must examine and count the eggs, and if any one has been broken, all the eggs must be lifted, clean straw or grass substituted, the eggs sponged with warm water, and returned to the nest.

Testing Eggs.—On the seventh or eighth day we can test the eggs to prove which are fertile. Although this can be done by repairing to a dark place during daylight, it is much better to do it at night, as the eggs need not then be removed from the hatching-house. A candle being procured and lighted, the eggs must one by one be held up and surrounded by the hands in such a way that the light is seen through the body of the egg. If a satisfactory test with the hands cannot be accomplished, a piece of thick cardboard may be taken, and a hole cut the same shape, but slightly smaller, than the oblong circumference of an average-sized egg. When the egg is fertile, there will be seen at the seventh day a black spot in the centre of the egg. An unfertile egg remains perfectly clear throughout.

The second test, and one which is beneficial to the eggs themselves, may be made on the eighteenth or nineteenth day. Having procured a basin of hot water, say about 105 degrees Fahr., of sufficient depth to easily float an egg longwise, let us proceed to the hatching-house, and while the hen is off the nest at her diurnal feed, remove the eggs and place them in the water. After they have been in a moment or two, those containing living chicks will be seen to bob about quite merrily. As soon as this movement is distinctly observed, each so moving may be lifted out and replaced in the nest, at the same time being distinctly marked with pencil round the smaller end. Such eggs as show no movement whatever are probably unfertile or contain dead chicks. They may be taken out and a very slight shake will decide the question. If, however, we may be doubtful about some of them, it is best to give them the benefit of the doubt, and after putting some distinguishing mark on them (such as a mark of interrogation), return them to the nest.

Are Tests beneficial.—Some may not quite see the reason of thus testing the eggs, and may think it a risky business. Let me assure those that there is absolutely no risk if ordinary care

be used; in fact the submersion in warm water is a helpful observance towards a successful hatching. The turf already referred to usually prevents the drying up of the white membrane; but in exceptional cases this may not be, and then the application of warm water is not only beneficial but essential. The test has several other advantages. For instance, the presence in the nest of useless or unfertile eggs when some of the eggs have hatched, is a source of not only inconvenience, but also of actual danger to the young and feeble chicks. Thus by giving us the certainty which renders the removal of those eggs possible, the test is decidedly advantageous. Again, it often occurs that some eggs, according to their freshness or otherwise, take as much as twenty or thirty hours longer than others to hatch. In such a case, unless we knew there were living chicks in those eggs, we might discard them, and so lose the chickens.

In ordinary circumstances the nest, after lying almost twenty-one days with its silent burden, is suddenly transformed into the home of many chirping and lively youngsters. At this most eventful time it is a great error to disturb the hen. A very brief visit for the purpose of removing broken shells, and seeing that everything goes well, is all that is necessary. If the hen is disturbed she is very apt to get fretful, and perhaps in her anxiety will trample on the delicate chicks, to the danger of their lives. For twenty-four hours at least the chicks are best left alone. They are during this period perfectly independent of food; for immediately before they emerge from the shell—after the shell is chipped in fact—the yoke of the egg passes into the young chick. This is one of the most bountiful provisions of a wonderful creation, for were it not for the great nourishment contained in the yoke, the chick could never assume such proportions so soon after hatching. We see the result in that the chick, in the brief space of twenty-four hours, is transformed from a weakly, small cheeper, unable to stand, into a lively and lusty youngster, able to scamper about and feed for itself. But I must now for the meantime leave the living chicks, and revert to a subject which I promised to dwell upon,—the subject of the “economy of hatching.”

The Economy of Hatching.—What I have termed the “economy of hatching” is the production of my own experiments. By its systematic adoption it renders possible what otherwise would be impossible—that is, to have at least twelve chicks, yes, and sometimes even twenty, following every mother. I have no doubt most of my readers would consider themselves fortunate if their broods averaged nine chickens, but I shall try and show how this average may be doubled.

To aptly describe this system of economy I cannot do better than relate the actual mode I have myself employed. For hatching operations nearly two dozen fowls are kept. Six or eight of these are large heavily feathered Brahma hens, all the others comparatively small, clean-legged, cross-bred fowls. The Brahmas are all old and trusted, trained to be patient sitters. Between 15th March and 15th May all the hatching operations are carried on, with perhaps the exception of a brood or two hatched earlier in the year for exhibition purposes. Now, with two dozen hens kept for hatching purposes, and all those to be set between 15th March and 15th May, it stands to reason that on an average there must be one going broody every third day; rather oftener, in fact. With this point kept in view, every egg when set is marked distinctly in ink with the exact day upon which it was set. Every hen is given her full complement of eggs, and whenever any casualty has taken place, a fresh egg, *distinctly dated*, is supplied in the place of the damaged one. Occasionally two hens may be set on the same day. To make it more practical, let us suppose that a hen designated A was set on the 20th March, and another hen, B, was set on the 25th of March, while a third hen, C, was set on the 27th of March. Suppose, further, that three of A's eggs were broken by the 25th, and that new ones were given to her on that day, and that other two were broken on the 27th, and fresh ones were substituted that day. Again, suppose that two of B's eggs were broken on the 27th, and two fresh ones added, then, when the eggs originally set under A were due to hatch, the ones added on the 25th would be given to B, while those added on the 27th would be given to C. When B's eggs were due, those given to her on the 27th would be placed under C. Now this system may seem very intricate on paper, but in practice it is extremely simple, and may easily be adopted by any one of ordinary ingenuity. It is perfectly marvellous the good results which may be achieved when this system is thoroughly carried out. Not only may the broken eggs be removed, but an experienced person can easily discern the unfertile eggs at the seventh day, and they also may be removed, and fresh ones substituted. In making it a success, however, we must remember to mark every egg set distinctly *in ink* with the exact date upon which it was set.

This is only half of my system of economy of hatching, the other part of it being as follows: Very often two, or sometimes even three, hens are set the same day. Now, of the original (please note the word original) eggs set under those three hens, possibly eight or ten may prove unfertile or be damaged. Suppose, therefore, on the day the eggs were due only 75 per cent of the original eggs hatched out, then the chicks would be

divided between two of the hens, and the third would receive an entire new setting. So would it be were only two hens set the same day. Suppose they received twenty-five eggs, twelve to one, thirteen to the other. If four or five of these should be damaged or prove unfertile, then one hen should have the twenty or twenty-one chicks, and the other would receive a fresh setting.

I have already mentioned that I keep some pure-bred Brahmas for hatching purposes. I make a mistake when I say *hatching* purposes; I should say *sitting* purposes, for seldom are the large, heavy, awkward creatures allowed to *hatch* any eggs. Those Brahmas are wonderful sitters, but they usually succeed in crushing several chicks to death if allowed to *hatch* them! I therefore adopt the plan of removing the eggs from under the Brahma the day before they are due to hatch, and place them under a lighter-bodied cross-bred hen. Sometimes a hen which has not sat a week will receive a setting just on the eve of hatching, and will therefore get out to the coops with her chicks after less than a week's confinement, with the result that in less than three weeks after she is helping to fill the egg-basket. As an instance of the fidelity of the Brahma as a sitter, I may mention that last season I set a Brahma on the 6th of April, and she sat steadily, without a day's interruption, until the 26th of June. During that period she hatched upwards of forty chickens and ducklings. When she was liberated she was in perfectly good health. Her treatment as to food and water, &c., was of the best, and during the warmer days she was off the nest for two or three hours at a time. Of course, this is an exceptional case, and not to be recommended to the ordinary farm poultry-keeper, in whose hands it might possibly result in fatal cruelty. Careful and most regular treatment is absolutely essential to all sitting hens, and much more to such as may sit longer than the twenty-one days. In my experience I never was satisfied unless the sitting hens left their confinement as plump, clean, and full of life and activity as the day they first entered upon their incubating duties.

I have already alluded to the fact that I never use artificial machines, and were it not for such a method as this my poultry-keeping operations would not have been nearly so successful. Experience will teach any of us how to carry it out much more minutely than I can on paper. It has been no uncommon thing in my experience to have one hundred chicks following six hens, sometimes over a score mothered by one hen!

Casualties during Hatching.—During our hatching operations many casualties may occur. On one occasion I remember going to the hatching-house and finding that one of the hens, although the door of her nest was shut, had forsaken the eggs

and commenced to scrape up the nest, with the result that the eggs were scattered to the four corners of the box, although luckily none were broken. They were absolutely as cold as stone; still with the object of experimenting I procured a pail of water as hot as the hand could bear and placed the eggs in it, where I left them for a few minutes. Then I divided the eggs between the existing sitting hens, after distinctly marking them with the date of the casualty. They had been set ten days when the casualty occurred, but only in one was found a dead embryo. All the others hatched out satisfactorily! One other instance to prove that we should never become disheartened or give up hope too readily. One very wintry morning in the early part of March I remember going out and finding that the fretful hen had expelled her newly hatched chickens from the nest, which in this instance was an open one. Three of the poor little things lay on the ground frozen as stiff as a board, and another lay in the nest to all appearance quite dead. Hurriedly I picked them up and exposed them to the warm glow of a kitchen range. Now the next day three of those chickens—the frozen ones in which there had not been the slightest sign of life—were skipping about quite merrily; the fourth died from what seemed to be a wound on the back of the head, probably caused by being trampled upon. It, however, revived after being put to the fire, but the wound seemed to suppurate and carried off the little fellow. I could mention numerous other illustrations of how we should never give up hope, but always do our best to improve matters.

First Food for Chicks.—Now to come back to the living chicks and consider their first food. For this purpose hard-boiled egg chopped fine, shell and all, is much the best. We can alternate this with bread-crumbs moistened with sweet milk. Then when they get older and stronger we may vary their diet with oatmeal, Indian meal or barley-meal, oats, wheat or barley. with occasionally a small quantity of hemp or buckwheat, Hemp is a grand thing for giving stamina. When very young they should be fed four or six times a-day, at ten days old three or four times a-day, and this continued for six or eight weeks, when the morning and evening meals are sufficient. My remarks allude to chickens which are wandering about continually picking up all manner of animal and vegetable food. A good feed of sound grain should be given the last thing at night. Constant variety in their food, apart from being beneficial, will sustain and quicken their appetites, which are apt to flag if a continuance of the same food be given. Barley-meal, bone-meal, oatmeal, Indian meal and bran, wheat, barley, small maize, oats, buckwheat, hemp, split-peas, rice, and

table scraps all lend their aid to the successful development of the chicken. As a beneficial and inexpensive tonic a little citrate of iron may be added to the drinking-water, just enough to colour it. This will brace up the constitution and prevent the same liability to disease in cold wet weather. During the whole period of chickenhood great attention must be paid to cleanliness and regularity in feeding. No superfluous food must be left lying about. In our eagerness to feed them well we often give them too much, which is a decided mistake. While the hen is engaged in maternal duties she also must receive generous diet, for as soon as the chicks can dispense with her attentions she must go back to the poultry-yard to produce eggs.

Weaning the Chicks.—The usual time for separating the mother from the chickens is when the latter are from six to eight weeks old, for at this age they are perfectly able to look after themselves. At about ten weeks old the male birds, which we do not mean to keep for stock purposes, should be singled out for fattening. This is best accomplished by placing them in wooden coops, each just large enough to hold a bird comfortably. Those should have barred fronts and sliding floors. The food should be of the most fattening description—Indian meal or buckwheat meal mixed with water, or what is much better, milk. Milk is a capital thing for whitening the flesh. No grain, except perhaps buckwheat at night, should be given them. As soon as those cockerels are any way fat, they should be sent to the poulterer's.

GENERAL MANAGEMENT.

All through the long summer days poultry should have as much liberty as possible. At this season they will require only a moderate amount of artificial feeding, for they spend most of the day preying upon grubs, flies, and other insects, varying this with vegetable diet. When the days begin to shorten, however, when autumn frosts diminish the amount of insect-life, we must supply a larger amount of artificial food. We must bear in mind that over-feeding is as great a hindrance to the thriving of fowls as under-feeding. When they are too plentifully fed they mope about listlessly, and do not forage. Thus the want of exercise congests the liver—in fact the whole system suffers. We must aim to supply just the right amount, and that must be given regularly. One day there must not be starvation, and the next over-feeding. My experience prompts me to think that small maize is a useful food for fowls *when they have full liberty*; but it is quite unsuitable, even dangerous, for those in confinement. In the warm days of summer, when

earth and air are swarming with insect-life, there is no need of supplying animal food ; if we are to have eggs in winter, however, it is positively essential. Thus we must regulate the description and quantity of food according to circumstances. In summer, if our birds have full liberty, they will thrive well on one meal a-day, composed of sound grains, a mixture of barley, wheat, and small maize being very useful. For the morning meal every one has individual preference ; but I would suggest as most useful a mixture of barley-meal two parts, oatmeal and Indian meal, of each one part. This must not be given in a cold sloppy mass, but should be made crumbly, not sticky, with boiling water, and given warm.

When our poultry are confined, they naturally suffer from want of exercise. To counteract this, it will be found an excellent plan to store dry leaves in autumn, and spread them in the run, substituting fresh ones whenever they become soiled. The grain may be thrown down among the leaves, when the fowls will scrape for it, thus exercising themselves. Another excellent plan is to tie a turnip, or some other favourite vegetable, about a foot above their heads, and they will exercise themselves by jumping up to pick at it.

Winter Fare.—About the middle of October we must put our fowls on what I shall term winter fare. The morning meal should invariably be composed of soft food, and must be given to them as soon as possible after daylight. To supply the place of insect food we should give our laying fowls some animal food. For this purpose Spratts Patent Limited have brought out an excellent preparation, which they call Crisel. It is pretty expensive, however, and I have found ordinary tallow-chandler's greaves (ground into meal) produce quite as good results. This may be obtained from any tallow-chandler, and is very moderate in price. When given to the fowls it should be scalded with boiling water, and mixed in with the morning meal in the proportion of one handful to every four or six fowls. It must not be given continuously, however, say only twice or at most thrice a-week. In very cold weather a little ground ginger sprinkled amongst the morning meal will considerably augment the number of eggs, as it has a wonderful effect in stimulating the egg-producing organs.

At mid-day a light meal, formed principally of green food, of which chopped lettuce is the best, should be given. Table scraps or potatoes mashed, with a small proportion of oatmeal, may be added to this mid-day meal. Then in the evening they should have a full feed of grain. A mixture of small maize, oats, wheat, barley, buckwheat, and hemp forms an ideal diet, but this may be varied in many ways. We must remember

that fowls have a long night of roosting, say from about 4 P.M. until 8 A.M. in the depth of winter, and it is the height of folly to fill them with rubbishy non-nutritious food. In winter, particularly when the ground is frozen, we must not forget to supply grit and shell-forming materials. Grit, or in other words small flinty pebbles, are the masticators of the food the poultry eat. Fowls have no teeth, and so are dependent on grit. Without it they would soon pine away, and the unversed would be unable to discover the ailment. They must also have shell-forming material, else they may lay soft eggs. This may be supplied in the shape of lime or broken oyster or other shells.

Eggs in Winter.—To reap the greatest amount of profit from our poultry we must endeavour to have a plentiful supply of eggs in winter. A great many people imagine that it is only the heavily feathered varieties of fowls which make good winter layers. I admit they have earned the best name, but from experiments I have proved that any of our light-feathered hardier breeds will lay well in winter *if judiciously treated*. The whole secret of success lies in those last three words. If we are to have eggs in winter we *must* supply the substitute for the insect food of summer already alluded to.

Shall we heat our Poultry-house?—There is one point about which a very erroneous idea is prevalent, and it is whether or not we shall supply artificial heat to our poultry-house in winter. Now to do this would be to make a great mistake. In my opinion a great many fowl-houses are too close already. What a trial it must be even to the strongest fowl to be penned up in an artificially heated atmosphere all night, and then allowed out at the first streak of dawn with probably several degrees of frost and snow on the ground! Such a proceeding is altogether out of reason, and whenever I hear of a man talking of firing his houses in winter I set him down as an ignoramus in matters pertaining to poultry-keeping. I would not on the other hand advise all the windows and doors to be left wide open, but let there be ventilation in winter as well as summer; damp and draught will do harm, but ventilation never!

STARTING A STOCK.

A few words to those who, having no fowls at present, desire to start a flock, or to those who, having a nondescript lot, desire to improve them, or substitute an improved breed. The best way to start a stock is to purchase a few specimens of the variety we mean to favour. For instance, suppose we purchase in February or March a cockerel and five or six pullets of a good laying strain, we might hatch about one hundred and

fifty chickens before the end of May. This is the best way to lay the foundation of a good stock. Another way is to buy settings of eggs and hatch them. In doing this we must be careful with whom we deal, as there are many unscrupulous men in the trade. If you pay too low a price you are almost sure to get inferior eggs. A reasonable price for good eggs is about sixpence each. To those who already have a stock of fowls, and desire to improve them, I would suggest the introduction of a few pure-bred vigorous cockerels of the laying breeds. The infusion of Minorca blood would improve the laying powers of any ordinary cross-bred stock immensely.

Keep our Stock young and vigorous.—And if we are to keep up our stock at a maximum of productiveness, we must keep it young and vigorous, killing all birds as they reach the age of three or four years. We must breed only from the best birds, every season hatching the eggs from our most prolific layers. A systematic and judicious selection will improve any stock.

MARKETING.

So many circumstances govern the marketing of our poultry and eggs that it is utterly impossible for me to give suggestions which would be applicable to all. In making one or two suggestions, however, I would first point out that if we wish to get the highest price for eggs, then we must go in for pure breeds, and endeavour to take some prizes with them. Once our fowls have made a name, we can easily get a good price for their eggs during the hatching season. But this article is not intended for those who go in for "poultry for prizes"; it is intended in these pages to advocate poultry-culture as an industry. This being the case, it will be well to consider the elements of success of the system upon which the culture of poultry is carried out on the Continent. I have given very full instructions as to their management and feeding. This we have to learn and decide for ourselves, as the climatic conditions are so different from those of continental Europe; but as regards marketing, what is practicable in France or Belgium is practicable in Scotland or Ireland, and I would therefore cull a few of my suggestions from the system adopted in those foreign countries.

In the first place, our utmost efforts must be put forth to place the produce upon the market in the best possible manner. A London egg-merchant recently stated that he could sell cases of foreign eggs without opening, as he could rely upon them being, as regards size, quality, and freshness, quite equal to what the brand led him to expect. Irish eggs, for instance,

cannot be bought with the same confidence. The first point to be gained is to earn a good name for the size, quality, and freshness of our eggs.

Sorting Eggs.—Before sending to market eggs must be sorted. No farmer would think of sending a lot of sheep to market with good ones and bad ones mixed together. The good ones would go by themselves, and the bad ones in another lot. Were he to send the inferior sheep with the good ones, he might probably have to content himself with an inferior price for the whole lot. And so it is with eggs. We must separate out the good ones, and they must be forwarded in a thoroughly clean condition. The eggs need not be very large; a nice lot of medium-sized, well-assorted eggs will command the very highest market price.

Packing Eggs.—The eggs should be packed in clean, perfectly dry straw, unless when the quantity is so small that patent egg-boxes with wire-holders may be used. Another point is, we must not hold for a rising market, else we lose the good name our eggs should have for freshness.

Storing Eggs.—It is always possible, however, when eggs are very plentiful and cheap, to store a certain quantity. For storing purposes a tolerably cool place should be selected. The best means of preserving them is to smear them with butter or lard immediately they are taken from the nest, and lay them in an upright position in boxes, covering each layer with bran. I say this is the best mode, but there are also numerous other ways in which they may be preserved, one of the most common being to submerge the eggs in a mixture of lime and water till they are required.

Conveyance to Market.—In this country it is usual for the producers to bring the eggs into the shops or stores of the small dealers. On the Continent they employ higgler, or as they are called there “coquetiers,” who go round with a cart day after day collecting the eggs. Those are at once transferred to the dealer, who packs and forwards them direct to England. It will be seen that this system secures the freshness of the eggs when placed upon the market. Now this is the system that requires to be adopted in our country before poultry-culture can prove a success. With this end in view, therefore, I would suggest that those interested in poultry should combine and appoint higgler for their respective districts. Those higgler could travel over such roads and on such days as might be arranged. They would call at the farmers’, crofters’, and cottars’ houses and collect the eggs, at the same time giving a receipt for the number received. One object of giving this receipt would be that each would have to

pay a share of the higgler's remuneration in the proportion of the number of eggs and fowls forwarded.¹

The preceding remarks have reference to the general marketing of eggs. In particular cases and in a moderate way it is possible to secure a much more profitable return for the produce of our poultry than by sending them to market in the ordinary way. There are hotel proprietors and private families in Edinburgh, Glasgow, and all large cities, who would be glad to contract for the direct supply of poultry and eggs, specially new-laid eggs, in winter. A very good price may thus be obtained.

Killing.—Poultry-dealers, as a rule, prefer to kill their own birds, and keep experienced hands for the work. To them any information respecting killing or dressing is unnecessary, but if we send our fowls direct to the consumer it is necessary that we should know the best way to kill and dress them. The usual mode employed for depriving them of life is by dislocation of the neck. This is certainly a simple way, but an improved method which is also very easy of accomplishment is as follows: After tying the legs of the fowl, hang it to a nail about 5 feet from the ground. Now deal a smart blow on the back of the fowl's head, after which insert a sharp-pointed knife through the roof of the mouth so as to penetrate the brain. With the blow on the head the bird is instantaneously rendered insensible, and the injury to the brain prevents any return of sensibility. Not only is this the most humane way of killing, but it causes the blood to drain from the veins, with the result that it will keep much longer. As soon as possible the bird must be carefully plucked, after which it should be washed. They should now be set, and as soon as cold they may be packed in perfectly clean hampers and in fresh sweet straw.

DISEASES.

Poultry in their originally undomesticated condition were doubtless harassed by very few ailments. Their domestication, however, with its concomitant variation in their existence—existing as they now do under circumstances of the most unnatural description—has been the means of making them subject to many diseases from which they were exempt in a state of nature. A great many of those diseases have been and are the outcome of gross mismanagement. If all the suggestions made in the foregoing pages be attended to, ailments of the more serious description should be unknown among our

¹ The higgler is only too well known in most country districts already, collecting from all and sundry, and not troubling himself to inquire how the eggs and fowls purchased may have been acquired.—EDITOR.

flocks. The subject of diseases and their cure is a large one, and it is only necessary to mention here a few of the complaints which are more common to our fowls, and to give brief directions how these may be best treated. Whenever a fowl is seen to ail, it should at once be separated from the others. Many ailments, which after a time would become serious, may be easily checked if attended to at once.

Apoplexy.—Of late years, owing to birds being very highly fed for exhibition purposes, this disease has greatly increased. Without any premonitory symptoms the birds will suddenly drop down to all appearance dead. Over-feeding, and the giving of over-fattening food too freely, is the cause. It is often too late for treatment to be of any avail. The best thing we can do is to give a dose of Epsom salts. It is perhaps the wisest plan, however, to kill the bird at once by bleeding it, when it will be quite fit for the table.

Bumble-foot.—When fowls are allowed to roost at a considerable distance from the ground, this ailment is often caused by their flying down on to a rough or hard floor. Particularly does it occur at moulting-time, as the birds have not the necessary feathers to make their flight easy. At one time when my experience was not so great as it is now, this ailment troubled my fowls to a considerable extent. By lowering the perches and covering the floor pretty thickly with moss litter, the exciting causes were removed, and I have never had a single case of it since then. When once affected it is difficult to bring the foot back to its normal condition. The best means towards this end is to lance the foot, and wash well out with tepid water rendered antiseptic with Condyl's Fluid. A bandage must now be put on, and the bird placed in some quiet corner, which has been well littered with clean straw.

Catarrh or Common Cold is very similar in poultry to what it is in the human being. It has much the same causes, symptoms, and treatment. We must guard against exposure to draughts and wet. A few drops of sweet spirits of nitre given in a teaspoonful of sweet milk is the most efficacious remedy. Cold sometimes develops into roup, however, and this is a very serious and infectious ailment, difficult of cure. While affected the bird should have food of the most nourishing description, and must be kept in a warm, well-ventilated house.

*Crop-bound.*¹—This is a very common ailment amongst injudiciously fed fowls. It is evinced by the unusual greed of the affected bird, together with a conspicuously prominent crop.

¹ The most usual cause of this is absence of sharp grit. Even fowls with unlimited run, after a few years of occupation, will begin to suffer from it—every sharp stone having been picked up, unless there is a well-metalled highroad handy. A dish of it in every yard should be kept constantly full.—EDITOR.

The most common cause is a surfeit of grain, particularly after a period of starvation, such as a long journey. Treatment must be prompt, for if left, the food soon decays and becomes a putrid mass. When taken early, relief can be given by manipulating the crop. To assist this, some tolerably hot water should be poured into the bird, a teaspoonful at a time. Then the crop must be continuously moved about, and its contents will probably be removed to the gizzard. Failing this, however, the crop must be opened, the contents removed, the crop washed out with tepid water coloured with Condyl's Fluid, and the wound sewn up. In doing this, the covering of the crop must be sewn up first, and then the outer skin. Silk thread and a very fine needle should be used for the purpose. After the operation the bird should be fed on soft food only for a few days, and should receive a very limited supply of water.

Diarrhœa.—This ailment originates usually from careless feeding. Sour food, or too much soft or sloppy food, will speedily cause it. Occasionally it arises from some irritant in the intestines, and still more frequently from a continuous spell of very wet weather. First give a dose of castor-oil, a small teaspoonful, to which should be added a drop or two of laudanum. Feed principally on boiled rice intermixed with a little powdered chalk; but as soon as the usual health returns, the ordinary feeding may be resumed.

Egg-bound.—When egg-bound the hen is unable to deliver the fully formed egg. Over-fatness is usually the cause, produced, doubtless, by the too liberal use of maize or other fatty foods. An injection of salad oil is beneficial, and fatty foods must be given very sparingly.

Gapes.—This disease so expressively named is entirely confined to chickens. It is caused by the presence of small worms in the throat, which set up irritation, so that chickens suffering from it constantly yawn and gape. It breaks out most frequently among the chickens on old-established farms where large numbers are kept, and the ground is naturally more or less polluted. The simplest remedy for this disease is to take a feather and introduce it into the windpipe; give it two or three sharp twirls, and then withdraw it, when some of the worms will be found sticking to it. It is helpful to dip the feather in a mixture of turpentine and olive-oil, as this will tend to dislodge the worms more easily.¹

Leg Weakness.—This occurs in chickens from want of exercise, and in adults when too large a quantity of flesh-forming food is supplied while they are in confinement. Full liberty and exercise is the first cure, while lime-water added to their food will assist nature to a great extent.

¹ Camlin used freely will be found a perfect cure.—EDITOR.

There are many other diseases, but those should never make their appearance in well-managed yards. In fact, several of those above mentioned should also be unknown.

CONCLUSION.

I commenced this report by alluding to the enormous annual payments to foreign countries for poultry and eggs. It may interest my readers to give a few statistics respecting the imports from Ireland. The principal Irish shipping ports are Dublin, Belfast, and Londonderry; while Cork, Greenore, and Waterford have a considerable share of the trade. The total value of eggs and poultry passing through those ports amounts to nearly two million pounds sterling per annum, and still there is an almost unlimited demand for the produce.

I need not go into figures or produce balance-sheets to prove that poultry-keeping will pay. That this industry, *systematically worked out*, may become a source of great integral wealth, is unquestionable; and I believe the day is not far distant when many of the thousands of pounds now going to foreign countries will be kept at home. That up to the present time the question of poultry-keeping has not received more attention, particularly as a means of livelihood to the distressed crofters and cottiers of our Highlands, appears to me most remarkable. With the development and systematic working of this industry, we have a means of alleviating a great portion of the distress; and in the place of miserable half-starved and badly clothed crofters, there would spring up a respectable and contented peasantry, earning comfortable livings out of poultry and eggs. In the first place, however, it is absolutely necessary that this question should be taken up in a practical and hearty manner by Government. A commission must be appointed to investigate the ways and means by which this industry may be placed on a thoroughly satisfactory footing. To secure this desirable result, co-operation is necessary.

Local shows must be encouraged, and where none presently exist they must be instituted. Every means must be adopted towards the improvement of all stocks of poultry. Ireland is beginning to go ahead in this direction, and quite recently appointed Mr Edward Brown, F.L.S., one of the highest authorities on matters pertaining to poultry-culture, to go over the country and ascertain the present state of the industry for the purpose of improving it if possible. The sum and substance of this gentleman's report states that the present stock of the country has been terribly reduced in size and productiveness by long-continued inbreeding. To remedy this state of affairs, Mr Brown, by a public appeal, secured free of any charge a

great many thoroughbred male birds of the more suitable breeds, and those were judiciously distributed over the country. Such a scheme as this is perfectly practicable and highly essential for our own Highlands. I feel sure there are influential gentlemen in every district of Scotland who would be willing to lend a hand towards the development of our poultry industry. One person acting on right lines can exert an influence which cannot be measured. All that is required is the spirit to undertake the business, and the determination to keep the end in view without wavering.

POULTRY FARMING.

By WILLIAM IRVING, 64 High Street, Dumfries.

I.—INTRODUCTION.

FARMERS in Scotland might always, and in some instances do, make poultry form a very valuable auxiliary to the live stock on the farm; but it is a fact not easily explained, that on the same farm where pedigreed horses, cattle, and sheep are kept, the most mixed lot of poultry are often to be seen. The lesson we desire to impress on our readers is, that if with all the large animals it pays to breed pure or first crosses, the same would be most likely to apply to poultry. In practice we have found this is so. In fact the very circumstances related applied in our own case, when we first took an interest in the feathered stock of the farm. In an article in this year's 'Transactions' of the Highland and Agricultural Society on *Calf Rearing*, by the Rev. John Gillespie, he says, "There is nothing more unsatisfactory or unprofitable than grazing and feeding ill-bred cattle," and the difference between good and ill-bred cattle is far less than between good and ill-bred poultry.

It must be a matter of grief to the political economists of our country to see such large sums of money annually paid to foreigners for eggs and fowls, when our own country is not made to produce the largest possible quantity it is capable of doing. No one is annoyed at the importation of beef and mutton, for there is no other country in which cattle and sheep are so well fed, so early matured, and such large numbers raised on the same acreage of land, showing that the beef and mutton production is almost at its maximum; whereas on not one farm in a hundred do the poultry get any attention except to collect

the few eggs laid, and abuse for not laying more. Is this not the cause that the importation of eggs and fowls bears a larger proportion of the amount consumed than is the case with the imports of beef and mutton? Do not let it be understood that prime specimens and pure-bred birds are not finer in this country than elsewhere; but the pity is that farm poultry, which can be maintained at so little expense—seeing much of their food consists of what they gather—does not profit more by the introduction to the farmyard of surplus pure-bred birds from the fanciers' runs. We will hereafter show that the cost is so little it need hardly be considered, and will pass on to the fowls which make up the feathered stock of a well-managed farm.

II.—THE BREEDS.

Hens, Ducks, Geese, and Turkeys.—Hens and ducks live altogether in the farmyard, or if relegated to some sheltered corner in one of the fields must be provided with a house in which to roost and feed. Geese and turkeys for a long period of their lives do well in the fields, particularly after harvest, when the stubbles are cleared of crop. Ducks and geese are water-fowl, consequently the better of having easy access to water—a small running stream or duck-pond is enough, but it is always wasteful to allow free access to a mill-pond or any large expanse of water. Hens and ducks are the egg-producers. All alike table fowls. Geese and turkeys grace the New Year's table, and are in season November, December, and January; ducks, when not laying, in winter, and ducklings in the early spring; hens or chickens all the year round, but most valued in May, June, July, and first ten days of August, before the game season is on. Eggs are scarcest in the winter, consequently then most expensive. It is therefore the aim to produce the finest geese and turkeys in December; ducklings in April, May, and June; chickens in May, June, and July; and eggs November, December, January, and February.

It is necessary to give a description of the fowls adapted for the different parts of the country. Almost each variety of the different breeds is to be found in every county in Scotland, so that this cannot be done without a general description of all. Underneath we give in tabulated form the names of the well-known varieties and sub-varieties. There is no distinction of any variety of ducks, geese, and turkeys. The varieties and sub-varieties of barn-door fowls are almost innumerable, and yearly being added to—whether with propriety or not we do not venture an opinion. Certainly no variety has been introduced to equal on the farm the aristocratic Dorking for table qualities, or the stately Brahma for profitable egg-production.

TABLE SHOWING VARIETIES AND SUB-VARIETIES OF POULTRY.

VARIETIES.		SUB-VARIETIES.	
1. <i>Barn-door Fowls.</i>			
Dorking	.	Coloured, silver-grey, white, cuckoo.	
Brahma	.	Dark, light.	
Cochin	.	Cinnamon or buff, partridge, white, black, &c.	
Langshan	.	None.	
Scotch Grey	.	None.	
Spanish	.	Black, white.	
Andalusian	.	None.	
Minorcas	.	Black, white.	
Game	.	Black-red, brown-red, duckwing, pile-black, white, Indian, old English.	
Malay	.	Black-red, brown-red, &c.	
Hamburg	.	Golden-spangled, silver-spangled, golden-pencilled, silver-pencilled, black.	
Redcaps	.	None.	
Continental—			
French	.	Houdans, La Flèche, Crève-cœurs, &c.	
Polish	.	Black-topped, white-topped, &c.	
American—			
Leghorns	.	Brown, white, &c.	
Plymouth Rocks	.	None.	
Wyandottes	.	None.	
Dominiques	.	None.	
Bantams—			
Game	.	All the varieties same as game.	
Rose-combed	.	Black, white.	
Sebright	.	Golden, silver.	
2. <i>Ducks.</i>		3. <i>Geese.</i>	
Aylesbury	.	None.	Toulouse . . . None.
Rouen	.	None.	Embsen . . . None.
Pekin	.	None.	Common Grey . . . None.
4. <i>Turkeys.</i>			
Black Norfolk	.	None.	Cambridge Bronze . . . None.
White do.	.	None.	American Bronze . . . None.

BARN-DOOR FOWLS.

Dorkings.—The Dorking, Surrey, or Sussex fowl is the old English farmyard bird, introduced into Scotland many years ago, where it has been bred quite as successfully as, if not more so than, in its native country. The characteristics of the breed are its size, square-shaped body, and white feet and legs—qualities particularly fitting it for the table. In fact, perfect table birds are never found without Dorking blood in their veins. It thus holds the first place for crossing with other pure breeds. They do not lay a great number of eggs, which are, however, of fair size. The sub-varieties, four in number, take their names from the colour of the birds. In breeding three of these varieties, type and size give place to colour; the fourth “coloured,” formerly called dark, are bred to type and size,

leaving colour out of the question; and on this account, for the profitable raising of poultry on the farm, we recommend the coloured Dorking to be one of the pure breeds which should always find a place.

Brahmas.—Next on the list come Brahmas, the dark variety of which we couple with the coloured Dorking for the farm. Hereafter we intend to describe the mode found profitable of breeding these two varieties, meantime passing on to the characteristics of this valuable breed, which was introduced in 1852. They are almost as large as the Dorking, exceedingly tame, have feathered legs, and lay a large number of the rich-coloured eggs so fancied by many egg-buyers. As winter layers, they have no equals. The great drawback to the Brahma is that the skin is yellow—consequently, on being cooked, turns dark; so that they never look well on the table. They are also inveterate sitters, which is objectionable.

Cochins, Langshans.—Cochins were the first Asiatic variety introduced. They are very similar to Brahmas (which have the same origin), perhaps a trifle larger, hardly as good layers, and are even worse for sitting. A flock of buff Cochins look beautiful, and, with the exception of Game, show specimens have commanded the highest prices. Allied to the Cochins are Langshans, black in colour, with a raven gloss. Some say they are black Cochins, but it is generally now admitted they are a pure variety; and it is certain they have a number of properties over the Cochin. They are better table birds, better layers, and not so bad for sitting.

Game, Malay.—As the Dorking is the aristocrat, so the Game is the military inhabitant of the poultry-yard. When fancy alone is the aim, Game birds are beyond all others. A true inhabitant of the British Isles, they have been bred pure for two centuries, the first 150 years of that time for cock-fighting, which was a national sport. Game are small, but of beautiful shape, and exquisite flavour on the table. For quality, a cross between Game and Dorking has beaten all others, and at the recent Dairy Show this cross added another victory, scoring a first in each of the classes for table fowls. Game lay a goodly number of eggs in the summer months, are hardy to rear, and those accustomed to them have no trouble in preventing fighting. Malay, sometimes called Malay Game, has many of the Game characteristics—larger and even more pugilistic. The cock may be described as the giant of the poultry-yard; he stands so high, and walks with a majestic carriage.

Spanish, Andalusians, Minorcas.—The black Spanish were for years a great favourite on many farms because they laid large eggs and are non-sitters; but the number of eggs is so small, and so useless are the birds for table use, that now they

are only found in the fanciers' pens. The large comb and white face are the great beauty points of Spanish; both, we think, detrimental to profitable commercial birds. Andalusians and Minorcas are not sub-varieties, but have a common origin from Spanish settlements. Consequently they are dealt with under the same heading. In character they are all very similar. Andalusians are slate-coloured; Minorcas have red faces instead of white as in Spanish.

Scotch Grey.—Scotch Grey are a rising valuable breed of poultry, good layers, nice on the table, fair size, and very hardy; not great sitters, but make good mothers. Colour cuckoo, single comb, four toes, and blue-white legs. They do well to keep as a single breed, but are difficult to breed good; and even the best specimens do not bring very high prices. This is owing to the want of a national poultry show, and because they are of local origin, at least confined to Scotland. If the Crystal Palace Show would offer prizes for this breed, we feel sure they would rapidly take up a good position.

Hamburg, Redcaps.—Hamburgs are a beautiful variety of small fowls, splendid layers, but the size of the eggs is like the birds themselves, so that for commercial purposes they are almost unworthy of support. We have seen it stated they are very good for crossing with some of the larger varieties to produce good laying hens. Redcaps are nearly allied to Hamburgs, but are rather larger, and so better table birds, and almost as good layers.

CONTINENTAL—*French: Houdans, La Flèche, Crève-cœurs. Polish*.—Of the Continental breeds the Houdan is the French Dorking, having all the properties of the English bird but size. They have a feather crown which is a disadvantage, enough to prevent Scotch farmers from keeping them. At the same time a Dorking-Houdan cross is about as profitable on a farm as anything we ever had, and beautiful birds besides. Black in colour, white skins, no crown, fair size, and good early layers. Of the other varieties named it is hardly necessary to say anything. The Polish varieties have never taken a firm hold in this country. They have large feathered crowns, and the white-topped variety is a most ornamental bird.

AMERICANS—*Leghorn, Plymouth Rock, Wyandottes, Dominiques*.—The American varieties deserve more than passing notice, owing to the hold they have obtained of the public, even though they are newly manufactured and recently introduced. All sorts of properties are claimed for them, no doubt with a certain amount of truth; but such statements should be taken with care. Leghorns were the first imported, and are something resembling Hamburgs and Spanish—almost as good layers as the former, producing nearly as large eggs as the latter,

and better table birds than either. Plymouth Rocks, which we fancy are the best of the group, have much the same properties as the Scotch Grey, with the advantage that they lay tinted eggs, but fail in having yellow legs—consequently dark-skinned. Wyandottes are much similar, hardly so big, and have yet to obtain the typical standard of a pure breed.

Bantams.—A description of hens would not be complete without a few words on Bantams. The only difference of characteristic in the Bantam from their larger progenitor is size; and though on the farm, where fowls are quite free from all idea of fancy, we do not recommend a Bantam to be allowed to go, yet if the farmer has a fancier's taste in the least, it will not be wrong of him to allow the young members of his family to keep a few Bantams.

Having now gone over the characteristics of the various varieties of hens, with the premiss that all are fairly distributed, let us touch on those which have been proved, and are in our experience best suited for the farms of Scotland. It is said that the breeds chosen for Scotland should be hardy, but we did not name a single variety which has not been successfully shown from Scotch yards at the National English Shows, so that in our selections we have never found evil to follow any breed from climatic influence. Hens occupy the premier position among the different breeds of poultry, because they are by far the best egg-producers; and if not the best on the table at certain seasons, still they are never out of place; and in the country, at any rate, a hostess cannot be taken at a loss with a well-stocked poultry-yard for fresh eggs, and young fowls grace any table.

One would think it a most difficult matter to make a selection of a breed or breeds for a farmyard. In reality the limits are narrow, more particularly taking into account the objects for which this report is being written, "The profitable Raising of Poultry."

From the entire number of varieties of hens, we select as best suited for Scottish farms, coloured Dorkings, dark Brahmas, black-red Game, Scotch Grey, and Plymouth Rocks. The first three being old-established breeds, are therefore very pure bred, consequently much the best for producing crosses. The new varieties are principally of mixed origin and have not yet gained a typical character. It may be, we think it is so, that highly bred prize animals are delicate, but it is well known that first crosses from the same are the hardiest of any.

Our favourites for the farmyard are a first cross between Dorking cocks and Brahma hens. All round they are undoubtedly the best. This is our own experience, and it is upheld by all writers of authority on poultry. A Game-Dorking or Game-Brahma are both excellent crosses; the former for

table quality unequalled, the latter also fair table birds, with very good laying properties. The reason we prefer the Dorking-Brahma cross to either of these is its extra size and its so early reaching maturity.

Scotch Grey and Plymouth Rocks are not very good for crosses, but both breeds are such good all-round fowls that we recommend any one who does not care for our favourites to fix on either of these, and breed pure.

It is easy and inexpensive to improve the poultry stock on the farm for whoever wishes to do so. The correct method to follow is the practical instruction given us years ago by the well-known fancier and breeder of Dorkings, Mr James Clark, late of Fochabers, now of St Bernard fame in Buckie, to procure from some good breeders a few of their best cast birds. A couple of coloured Dorking cockerels at 10s. each, and six to twelve dark Brahma pullets or first season hens at 7s. 6d., are all that is required, and the total outlay under £5. Run them together, and set every egg from 1st January to the end of April, but not later. The result will be 150 to 200 chickens, the pullets of which become the egg-producers and ready to lay in the autumn and winter months, the time fixed as best to have a good supply of eggs. The cockerels at four to five months will weigh 5 to 6 lb. and fetch 2s. to 2s. 6d., they also being ready to dispose of at the time young fowls are most in demand.

It is also well to note that when the improvement has been continued two or three years, the first and second year's hens will lay well in spring and summer, so that from this one breed of crosses there may be expected a large production of eggs all the year round, especially when they are worth most money.

In keeping a profit and loss account of the poultry-yard, extraordinary results have been made out on both sides. We do not think reliable figures are easily ascertained, and farmers do not care to be troubled by calculations. Comparison will suit better. Consider the difference in value of a calf the produce of a Galloway or Ayrshire cow by a shorthorn sire, to one without any well-bred points about it. Why, the one at the right time of year will fetch £2 to £2, 10s., the other 10s. to 15s. In like manner a well-fed Dorking-Brahma cockerel is worth 2s. 6d. to kill, when a common-bred farmyard bird will not fetch more than 1s. 3d. to 1s. 6d. The improvement of the farmyard poultry by the introduction of new stock costs under £5. The advance of one shilling each gained on a hundred cockerels, which there will be to dispose of, quite equals the first outlay, and the increased value of the hens, together with a larger production of eggs, represents a handsome profit. Further, the new stock will have such an infinitely better appearance that every one will take notice of the beautiful large hens, so that their

owner will begin to take a pride in them, and consider their ornamental character enough, had nothing more been gained.

As hens should always, of all the breeds of poultry, be in largest numbers on the farm, so it is that the hatching, feeding, housing, and general treatment is of more importance, and must be considered at greater length than for the others. It has been pointed out as a fast rule that chickens should be hatched from 1st January to 30th of April. In recent times, and since we ceased to be actively engaged in poultry-keeping, artificial incubation and rearing have made rapid strides, and been almost perfected. It would be invidious to select from the different makes the best

machines; but to keep poultry profitably, it is necessary to use an incubator and rearer. The farmer should have them of the very best. Each maker supplies books of instructions, which, if followed correctly, generally ensure success. Fig. 1 is a drawing of the coop, which should follow a rearer when chickens are two to four weeks old. This coop can be made by any joiner, but is rather expensive, costing 15s. to £1.

From it the pullets are drafted into the hen-house, which is the ordinary fowl-house of the farm-yard, the cockerels into the cockerel-house, to be described hereafter. To hatch without artificial means, there is much more labour entailed. It is all very well to set a hen anywhere she wishes, but the chances are without success. The method to follow is to get an unused room, with locks to prevent intrusion, in the house, yard, or where convenient. Have a dozen of boxes similar to fig. 2, costing 2s. each. Form the nest of turf or ashes on the floor, hollowed out in the centre, with short hay to make it soft; use plenty in cold weather, not so much when warmer, as the plainer the nest the better. Over this place the box. Change the hen at night into the nest, on to three china eggs. Let her sit until learned to it. Then again at night give her eggs, nine in cold weather, more

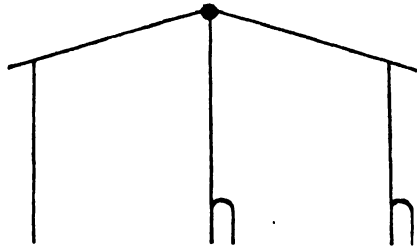


Fig. 1.—COOP TO FOLLOW ARTIFICIAL REARER. 3 ft. 6 in. long; 3 ft. wide; 1 ft. 6 in. high.

Both sides of roof sloping and hinged; one side glass; no bottom; two holes in front under glass, and two in partition; ventilation at top. Cost 15s. to £1.

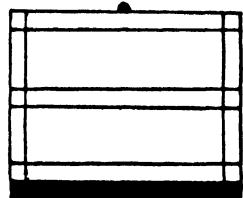


Fig. 2.—NEST-BOX. 1 ft. 6 in. square; 1 ft. 3 in. high.

Close all round; similar front to drawing, which is fixed behind bottom bar, and thumb-nob at top. Price 2s.

when warmer; but it is not prudent to give over thirteen—that is, to average-sized hens. Allow her off every day for at least half an hour; but when learned, she may be allowed to come off and go on at pleasure. Her food should be Indian corn alone, and water. A large dust-bath of dust-ashes, or anything in which she can scrape, must be provided. Throw into it a handful of sulphur. Hens sit twenty-one days. At the eighth day examine the eggs against a candle, with a dark board. Place the egg on a hole in the centre of the board. If fertile, it is perfectly dark; if unfertile, clear. Remove all unfertile eggs. Two or more hens should have been set together, and should there be so many clear eggs that only enough fertile

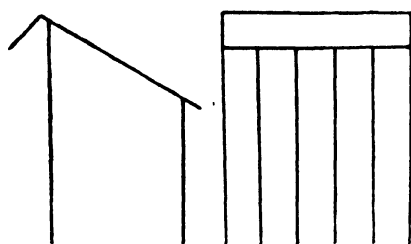


Fig. 3.—Coop. 3 ft. high in front, 2 ft. high behind; 1 ft. 9 in. wide; 2 ft. 6 in. long. No bottom; sparred front. Price 5s.

eggs are left for one to cover, give them to the best hen, and set the other at liberty, or reset her. On the twentieth day examine again. Some will be chipped, and it might be some out. Take away all empty shells, and whenever the chicks are all dry, remove out on to the grass. There should be no exception to this rule. If the ground be covered with

snow, get them on to turfs or soil till the snow goes, then out into a coop (fig. 3, price 5s.) Select a sheltered spot on short grass; see that no draught can blow into or through the coop; have it well ventilated with holes under the eaves. After each brood leaves as described already, have the coop painted with carbolic-acid water.

The food for the first two or three days—oatmeal, a little wet, mixed with hard-boiled eggs. The eggs laid aside as clear are used for this purpose, and no others are required, for chicks can do without them if no clear eggs are to be had. Afterwards food consists of two-thirds oatmeal, one-third sharps or fine bran, and a pound of bone-meal added to each stone of the mixture. When the chickens are large enough, give wheat mixed with Indian corn, and afterwards Indian alone. When they are removed the pullets are fed similarly to hens; the cockerels continue on same diet as when chickens—soft food twice a-day, and Indian at liberty. Just a word on the feeding of the hens and breeding-pens. All scraps to be got about a farmhouse are useful, but every one knows how to use them. The extra food should consist of boiled turnips mixed with ground (smash) oats given in the morning. Two meals are

enough, and the evening one should be good sound grain of any kind, but *not* Indian. On housing there is no need to frighten any farmer by elaborate descriptions. The fancier can do what he likes. Two houses and one run are all that is necessary. The general farmyard house must be on the ground-floor, roomy, warm, and no draughts, well ventilated from above. Any square building will do. If none is available, a cheap one can be erected with old railway-sleepers and an iron roof. It must have no cross-beams. The perches, 3 inches broad, should be raised 2 feet from the floor. The nests may either be made for the purpose, or round cheese-boxes do splendidly. Be sure and have enough. The second house, called the cockerel-house, is just similar to the hen-house, but must be away from the yard. A field shed does well; far enough off (so that the cockerels cannot mix with the hens), and near to a small stream to ensure plenty of drinking water without labour. The cockerels are removed here at six weeks old; each lot in succession well fed in the same way as when younger, and killed or sold off as ready, just the same as fat cattle and sheep. The greatest waste on farms is inattention

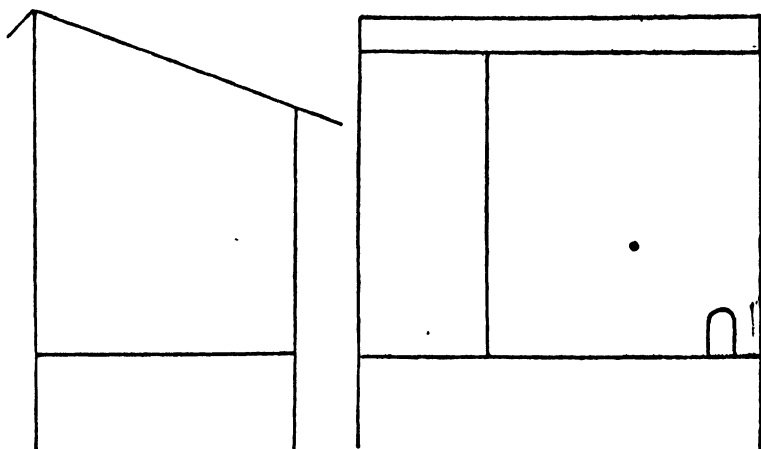


Fig. 4.—HOUSE FOR SIX TO TWELVE HENS. 6 ft. high in front, 4 ft. 9 in. behind; 3 ft. 6 in. wide; 5 ft. 6 in. long; floor 1 ft. 6 in. from ground. All sides but front boarded to ground—it to be left to allow a covered shelter for birds. Cost 30s.

to draft off from among the hens the cockerels, allowing them to go to waste without any return. Birds going this way never get fat, and consequently give little or no return to the breeder. The last house, of which a drawing is given (fig. 4), is to hold the breeding-pen of a cock and six to twelve hens. It is surrounded by a run if near the farmyard, but if convenient

the run can be done without when the house is placed out of reach of the other poultry in one of the fields. The house will cost 30s. ; the run, which must be 30 to 45 yards square, will cost 1s. 6d. a yard. The fence consists of 3 feet at the bottom boarding, and 3 feet of wire netting above ; but when there is a suitable corner against a house or wall the cost is reduced.

The general treatment of hens has been pretty well dealt with already, so that it is not necessary to say much more. Fowls, like all other farm animals, thrive best when due attention is given to feed them at fixed regular intervals. Keep the food and water troughs clean and sweet, the houses thoroughly cleaned and lime-washed at regular seasons three or four times a-year. See that the ventilation is good ; do not cause the birds to breathe foul air, which is poison. This is the rock many poultry-keepers are wrecked on. Kill off all hens at two years old, unless they are favourites, specially good layers, or good sitters and mothers. In the latter case they are most useful, and should be retained till age disables them.

DUCKS.

Aylesbury Ducks.—This variety is the oldest known. Its characteristics are snow-white plumage and delicate flesh-coloured bill. To perfection it is only reared in and around Aylesbury, but good specimens are often met with all over the country. It is the earliest and best layer, but not the largest.

Rouen Ducks are the largest, grey in colour, and the drakes are most beautifully marked. They are difficult to breed good, but are very hardy and easily reared.

Pekin is a newly introduced variety, which has rapidly sprung into public favour,—white in colour, with a yellow tinge on the feathers, and yellow bill. They are large birds, but stand high on their legs, which rather detracts from their appearance. By many they are considered to be the best all-round duck, and we are inclined to this opinion.

Ducks do not require any special treatment, but must be housed by themselves (not under hens, as is common) in any convenient place of easy access. It is not necessary to have a special house, for in a farmyard there is generally an odd place, such as under a stair, or unused pig-sty, in which they will be comfortable. It should have plenty of light, be kept well littered with clean straw, and a shallow trough filled with water in the corner. Into this the food is thrown, which entices them home at night, as they are inclined to wander late. Ducks are not suited as mothers to rear their own young, but hatch very well. Hens are mostly used both to hatch and rear ducklings, but of all poultry they are most suited to be hatched and reared in the incubators and rearers. The best food for

ducklings is oatmeal porridge; or on meal of any kind, mixed very thin with water, they do well, and at about a month take to grain. They should not be allowed to get wet on the back till six weeks old, and never at all if intended for the early market.

GEESE.

Toulouse.—The Toulouse variety are grey in colour, tall and erect in carriage, with their bodies hanging to the ground.

Embsen.—White lay rather better than the Toulouse, and are almost as large.

Common Grey.—Correctly speaking this is not a pure variety, but is met with so frequently that it deserves a place. Without the characteristics of either the Toulouse or Embsen, it might be spoken of as a cross; but for all that it is the result of mating birds of the same kind together. To pick the best variety is not of so much consideration as to have large strong birds, whose offspring will be hardy and grow well. Goslings are very hardy, and take to eating grass early as their staple food. Till then they are fed as ducklings. They require less attention and food than any other breed, which of course leaves more profit. It is well to have a good number, as the labour is all the same to attend to them when fattening, which is the only time they require attention. To fatten a flock of geese they are put in a court, either with or without a house, about the 1st of November, and from that time get no more liberty. The food must be good, principally cooked roots, mixed with any kind of meal, twice a-day, and a good supper of grain. They are disposed of about the middle of December, but a few may be got rid of all through the autumn as Michaelmas geese. This is not a Scotch custom, and the demand only arises from English people, so is of little account.

When treated as described, we are of opinion that geese are most profitable—certainly more so than turkeys, and little behind ducks, even taking their laying qualities into account. And every farmer, his wife, or daughter will be proud enough to be complimented on the flock of geese from three pairs of breeding birds, numbering close on fifty. At the late Dairy Show the victory of Miss Picken, Kirkcudbright, with a Toulouse gander, proves that as good geese can be raised in Scotland as in the South, which is very satisfactory.

TURKEYS.

Black Norfolk are black in colour, only fair in size, but far the hardiest variety of turkeys, and are most common in Scotland. There is a white variety much similar, but owing to these being rather delicate, they are seldom kept.

Cambridge Bronze.—This variety have bronze-coloured feathers with a white tip. They are far the largest, but more delicate than the Norfolk, and not so prolific.

American Bronze.—Red in colour, fair size, good layers, but have not as yet become very fashionable in this country.

Turkeys are the most imposing inhabitant of the poultry-yard, though the least profitable. Yet on all farms where poultry are attended to, we would recommend a cock and two or three hens to be kept for breeding purposes. They do not lay many eggs, which, though at times offered in the market, are neither regular in supply nor demand; and a single hen turkey does not lay enough to pay for her keep all the year round. Of the breeds, we prefer the Black Norfolk, and they should be kept where the situation is cold.

The Cambridge Bronze does well in a warm and sheltered place. Young cocks 20 lb. and over, and hens 15 lb. and over, make 3d. per lb. more than those of less weight, so that if at all possible the largest breeds should be kept, and to get them to these weights careful breeding is necessary. At the same time they are easily reared to such weight, if proper attention is paid to them. They do not want a lot of attention—for turkeys are of a very wild nature, preferring to lay in a hedge-row or wood to a house, where, if they are secure from intrusion, they do quite well. Collect the eggs daily; but put two or three nest-eggs into the nest, and when the hen sits put a coop over her, leaving the door open. When she has agreed to the change, give her thirteen to fifteen of her eggs, and put any other under hens, so that all the chicks may go to the turkey mother when they hatch, in twenty-eight days. The chicks are delicate; but she makes a tender careful nurse, and with the above treatment we never remember to have had so much fatality in turkeys as some people experience. The food is different than for any other fowls, but is simple and cheap, costing the labour of preparation only. It is nettle or docken leaves chopped fine, mixed with a little oatmeal, and butter-milk poured over the mixture. To fatten they are treated similarly to geese, but require a house to roost in. The food is also the same, only they are apt to get surfeited and go off their food. If this does occur, give a tablespoonful of salts to every four birds in the soft meat, which should put them right in a day or two.

III.—DISEASES.

It is scarcely necessary to write on disease, not that it is not prevalent in poultry-yards, but because it should not be in any well-managed yard. Prevention is better than cure. Cleanli-

ness and ventilation are the watchwords of success; attend to these and nothing more is required. If disease does break out, we believe the very best treatment is to apply the "slaughter order," and stamp it out, disinfecting all the house, coops, and runs. The diseases most to be dreaded are cold and roup. The latter we hold is a development of the former, and it is often the result of bad treatment above warned against. To treat cases of this kind, the first thing to do is to remove the cause, which generally, without medicine, proves effectual. For medicine, an iron tonic does a great deal of good. Give sulphate of iron dissolved either in the drinking water or the water for mixing the food. Make it just fairly acid in taste. Fowls require strong medicine. Oil is freely recommended in many books. Our experience leads us to say, never on any account give it, for it does not agree with birds—they are so sick and ill after getting it. If a laxative is required, as in cases of indigestion, crop-bound, or anything of that nature, which often are found where roup is, give a pill of $\frac{1}{2}$ drachm aloes, 2 grains calomel, and ginger and glycerine to make it the size of the point of one's little finger. These pills we have thoroughly tested, find them perfectly safe, and never failed to get the desired action.

Gapes is a disease which proves terribly disastrous among chickens. We never had the experience of it, but believe it only asserts itself in unclean houses and on foul ground. To prevent the latter occurring, chickens should not be reared two years in succession on the same place. Gapes often clears out young pheasants, which are even more tender than chickens. We last year saw a gamekeeper in the Stewartry who had close on 1000 birds under his care, and he said he never had gapes among his birds, because he attended to the rules laid down above. We cannot recommend treatment; none has ever been perfectly successful, nor even fairly so, when once the disease establishes itself. When speaking of disease, the pests of the poultry-yard may also be touched on—lice. On old hens at liberty lice are seldom found, or if so, they do no appreciable damage; but on chickens they are torture, and must be kept in check by either dusting the birds with sulphur or one of the prepared insect-powders. The henwife should keep a constant look-out on the young birds, and when it is found they are infested with the vermin, treat as above.

IV.—EXHIBITING AND SHOWS.

In writing this report no mention has been made of showing, for there is a pretty general opinion that animals bred to show cannot be profitable. This is not our opinion; and any farmer,

his wife, son, or daughter, who takes an interest in the poultry-yard, and understands the management thoroughly, can greatly add to the profits derived from it by breeding and rearing at least a few sittings of pure-bred birds as well as the crosses before advised. Dorkings and Brahmas would be preferable, especially the former; and there is nothing to hinder the sale of a few of the best young birds at large prices. These are no idle ideas. In 1884 we sold a cockerel at £20; but our preceding history in poultry matters was exactly as we assert most farms now are in regard to mismanagement. The necessities for entering on the breeding of pure birds are considerable and within the reach of every one. They consist of a few houses similar to the one described, and they can be added as required. Place them in various fields out of view and reach of each other, where the pens of pure-bred birds will be kept in the laying season. Afterwards the best cockerels are drawn out of the general lot. Put one to one of these houses with an old hen well fed, and as a rule they soon grow into birds fit to be seen at any show. This method in former years was so successfully followed by the Viscountess Holmesdale that her yard became the most famous in the country, and her success has never been surpassed if equalled. At present it is followed with great success by the Scottish Dorking fancier whose name has been already mentioned. To keep show poultry on the farm is not commendable if not kept in its proper place. A farmer and his family might take themselves up so much that other work would be neglected; but there is no reason why this should occur. The attention and food required by good birds is not more than by mongrels; and when good ones are being prepared and sent off to shows, this is all accomplished in the evening after the day's work is finished. From experience we never spent any time on our poultry which should have been given to attention to the farm—in fact we were not allowed to do so; and yet we bred many good birds, and took a lot of prizes,—above all, realising a handsome profit for time which might otherwise have been wasted, besides having a pastime affording delightful pleasure.

On shows, if not savouring of egotism, we will just point out what, if put into practice, might make the poultry section of your Society's show of more interest and general good. You do not wish it in any way to be for the benefit of fanciers alone. In fact, they as a class do not take the advantage your liberal prizes offer. Suppose a number of the fancy breeds to be struck out of the list, and in their place prizes offered for a pair of cross birds, cockerel and pullet, which, after being examined by the judge, are killed and trussed, then examined again, and the prizes awarded on the double examination. A

second class would be for pullets or hens only, the conditions being—5 best cross-bred pullets or hens for farmyard, judging them by shape, size, uniform character of the lot, and general appearance. Taking such points into account, it is easy to adjudicate on the best pen for the farmyard. Prizes for eggs are also given at some shows, and this is commendable, as the competition caused will arouse interest among those otherwise quite apathetic on the value of “neat bred” poultry, which may in the future be the means of bringing attention to bear on a neglected but profitable branch of the agricultural industry.

ON THE PRESERVATION OF THE LOBSTER.

By W. IRVINE FORTESCUE, 26 Dundas Crescent, Kirkwall.

No doubt men first caught lobsters by looking for them on rocky shores, at low spring-tides, in the months of April, May, and June. It is only at this season that lobsters visit the shallow waters, and, unless at exceptionally low tides, their haunts are inaccessible. In a few suitable spots lobsters may still be taken in this manner. To be successful at this sport—for sport it is, of no mean degree—one must, by frequent and diligent search, become acquainted with every rock and stone and crevice in the locality about the lowest low-water mark. Only those who have waded cautiously among the large oar-weeds, at the extreme limit of the lowest spring tides, and have seen a noble full-grown lobster resting on the glittering white shell sand at the entrance to his stronghold, under an overhanging rock of yellow sandstone, can have any idea what a beautiful object *Homarus vulgaris* is when seen at his best, painted in blues and yellows, with his crimson antennæ waving gently to and fro in the perfectly transparent water. But, alas! where ten or fifteen years ago one could often take six or eight lobsters in a tide, one can now rarely find more than three, and frequently none, while they have fallen off as much in size as in numbers. That terrible engine of destruction the lobster creel or pot, which may be seen wherever crabs or lobsters are fished for, has done the deed.

Before the introduction of the lobster-creel, lobsters were caught in ring-nets. These nets were baited and set like the creels, but while the creels may be set at night and visited in

the morning—for if a lobster once enters one he probably very rarely finds his way out again—the ring-nets require to be hauled at intervals all through the night, otherwise the lobsters leave them as soon as they have eaten the baits. This entails much harder work on the fishermen, and makes fishing possible only when winds are moderate. These ring-nets are still occasionally used in the Orkneys. Lobster-creels are baited with pieces of fresh fish, and are set, at intervals of 20 yards or more, in a line along the shore. This belt of creels is gradually moved along the coast, and worked into shallower water as the season advances. At the beginning of the principal lobster-fishing in early spring the creels are, I am told, set in as much as 18 fathoms on exposed coasts, and, even as the summer draws on, they are seldom set in less than 6 fathoms. In sheltered inlets they may be set in winter and early spring in 4 fathoms, and worked in, as summer comes on, almost to low-water mark. The creels are visited once or twice a-day. On exposed coasts this fishing can only be pursued when the sea is smooth, but in sheltered waters it is carried on all the year round. It is abundantly evident that this mode of lobster-fishing, as at present carried on, must result, in the near future, in the total extinction of the most valuable of our crustacea—the total value of lobsters landed in Scotland in 1889 amounted to £24,449—and the question naturally arises, How is this to be prevented?

Act 40 & 41 Vict. chap. 42, 1877, gives the Board of Trade, perhaps now the Scotch Fishery Board, full powers to “restrict or prohibit, either entirely or subject to any exceptions and regulations, the fishing for and taking of edible crabs and lobsters¹ within the area named in the order, during such period of years, or during such period either in every year or in such number of years, as may be limited by the order, and may provide for enforcing the order by fines not exceeding £20 for each offence.” Here one would imagine at first sight was the panacea for the whole trouble. It may be argued that this arrangement would not be sufficient to prevent the extermination of the lobster, and the fact that salmon and oysters have decreased in spite of a close time, might be brought forward in support of this argument. The primary object of such legislation is, presumably, to allow to the animal protected, peace to

¹ By the Act 48 & 49 Vict. c. 70 (14th August 1885), it is provided (sect. 11) that—

“All the powers and duties of the Board of Trade, so far as they can be exercised in Scotland, with respect to—

(a) Oyster and mussel fisheries contained in the Sea Fisheries Acts and the Fisheries (Oyster, Crab, and Lobster) Act, 1877;

(b) Crab and lobster fisheries contained in the last-mentioned Act;

(c) Clam and bait beds contained in the Sea Fisheries (Clam and Bait Beds) Act, 1881,

are hereby transferred to the Fishery Board.”

reproduce its species; but another quite as important effect, if the time be sufficiently long, is to restrict the number of animals, caught in any period of years, to within the number which will arrive at maturity in the same time. That is to say, if an animal is in danger of being exterminated by man, all that is required is to make the close time proportional to the rigour with which the animal is captured during the open season. A six months' yearly close time, commencing on the 1st of June, might save the lobster from extinction at the present rate of capture, though it might be found necessary to increase the period to nine months; while a close season of 364 days in each year, would for some time probably be necessary, to allow exhausted waters to become restocked. On coasts exposed to the Atlantic, storms afford a partially effective protection. It is the sheltered bays and inlets which suffer most. The only really valid argument against a sufficient close time is, that it would inflict hardships on men who gain much of their earnings from the lobster-fishing. At the same time, it seems to me rather more than an open question, whether it would not be better to suffer hardships from a yearly restriction than from an ultimate perpetual close time, when fishermen shall have succeeded in exterminating the *Homarus* that lays the coral eggs.

Apròpos of artificial rearing, we may glance cursorily at the life-history of the lobster. All lobsters are hatched from eggs, which are carried for months by the females, attached to her swimmerets merely by threads of hardened viscid matter. Extraneous substances are brushed off by the mother, and a flow of pure water among the eggs is secured by her movements. According to Bell's 'British Crustacea,' fishermen have asserted that hen lobsters protect their young for a short period after they are hatched. The young lobster emerges from the egg in a larval or zœa state, totally unlike its parents both in form and habits. While in this state it spends its life in swimming hither and thither, probably at or near the surface of the sea, carried about by the currents of the ocean, doubtless frequently wandering far from its birthplace. Before they pass through this zœa state, millions must be devoured by the shoals of young coal-fish and other marine animals frequenting the shallower waters. By the end of a month or six weeks the zœa has passed through several most interesting stages of evolution and has arrived by gradual changes at the perfect state. It is now a miniature lobster, about an inch in length, and takes up its abode wherever it may have chanced to settle down on the bottom of the sea, unable to wander far, but moving into shallower water in spring and summer, and retreating to deeper water before the storms of winter come

on. I never met with a lobster under $7\frac{1}{2}$ inches in length among the rocks, and very few under 8 inches, though I have searched carefully over and over again in likely and unlikely places, from high-water mark to the limit of the lowest spring-tides. I presume, therefore, that, in the Orkneys at least, lobsters under the above size keep to deeper water. As every one knows, a lobster has two large claws or pincers. One is sharp and cutting, the other larger and more massive, and formed for crushing. Sometimes it is the right-hand and sometimes the left-hand one that is the crushing forceps. From the remains of crab-shells and the opercula of periwinkles which I have found in the stomachs of lobsters, and from the much-used appearance of the tubercles on the inner edges of the crushing pincers, I have no doubt the lobster uses it for cracking the shells of the unfortunate crabs and molluscs which he may come across. The cutting forceps are probably used occasionally for catching fish. Once, attracted by a slight splutter, I found under the sea-weed a common green crab grasping with one of his forceps a living fifteen-spine stickleback; and if a green crab does this, a lobster probably enjoys a fish dinner when he can—even perhaps attacking small conger-eels, which I have frequently dragged from lobster-holes.

It is of course universally known that the lobster is in the habit of casting his shell or exoskeleton as he grows larger and it becomes too tight for him. Mr Saville Kent tells us that the lobsters change their skins some half-dozen times in the first six weeks of their existence, and at more lengthened periods as they grow older. I have met various hoary old specimens on whose giant frames the serpulæ and barnacles were evidently the growth of several seasons. Lobsters whose exoskeletons are free from these shells are called “travellers” by some fishermen, from an idea that they are migrating from deeper water. I never found a soft lobster—that is, one who has cast his shell, and whose cuticle has not had time to harden. Fishermen tell me they occasionally take them, or took them, in ring-nets, but never in the modern lobster-creel. *Homarus vulgaris* lives almost exclusively on a rocky bottom, though occasionally he may venture out from the sheltering sea-weeds. I once found a lobster on a sandy bottom, in about 6 feet of water, and about a dozen yards from the nearest sea-weed, and managed to lift him into the boat with a boat-hook, or rather he lifted himself, for when he did let go his hold of the boat-hook it was a moment too late, and he fell into the boat instead of back into the sea. I also once caught a couple of lobsters in a trammel-net set on a sandy bottom, but close to rocks and sea-weed.

The eggs of the lobster can be easily stripped from the

swimmerets of the hens, without doing the slightest injury to either. The eggs can be hatched in floating boxes, as has been done by Mr Neilsen in Newfoundland, or, after the manner of salmon ova, on trays or grids. We have it on the authority of Mr Saville Kent, F.L.S., F.Z.S., that the newly hatched lobsters can be easily reared through the zoea stage, in even a glass jar holding a quart of water, provided the water is regularly changed once a-day. If liberally fed on pulped fish and shellfish, and if too many are not kept in the same receptacle, they will not eat each other. Numerous small vessels on this account would probably be better than large tanks. As soon as the young lobsters have reached the ambulatory state, they can be turned out to shift for themselves on suitable ground below low-water mark, although the larger they are before they are turned out, the less risk there is of their being devoured by marine animals. Here, then, is a comparatively simple method of restoring exhausted waters, and of increasing the supply of lobsters for the market. But then arises the all-important question, "Who is to pay the piper?" "The landlord, of course," doubtless remarks the man of advanced ideas; but let us hope that such an enormity as a lobster-rate will never be laid on the already over-burdened landlord. What with school-rates, road-rates, poor-rates, ministers' stipends, income-tax, and Crofter Acts, Highland and Island landlords have a sorry time of it; so much so, that only those who have a good deal of valuable property elsewhere than in the Highlands and Islands, could afford to be so philanthropic as to rear lobsters at their own expense in order to turn them out for their tenants, and other people's tenants, and people who are not tenants, to catch. Before either private individuals or a company could be expected to undertake the hatching, rearing, and turning out of young lobsters on a scale large enough to be of any real use, they would require to obtain from the State the exclusive right to a part of the coast within a circumscribed area for a number of years, on which they could turn out their young lobsters. Small rocky islets, sloping gradually out to deep water, especially in sheltered situations, are admirably suited for such a purpose. Under present arrangements, however, even if the Fishery Board were willing to grant such rights for a period of years, it would—judging at least from the cost necessary to acquire the sole right of dredging oysters on an exhausted bank—be so costly as to preclude the attempt being made. I know of one or two fished-out oyster-beds which, if handed over to private enterprise, at first at a merely nominal rent, would become productive and valuable, while at present they are of no use to anybody. Could a plan of lobster-farming be put in practice, it would

help to retain in this country at least a part of the £20,000 or £30,000 which the British Lion annually pays for the million or more of lobsters which he imports from foreign countries. I do not hold that the State should rear and turn out lobsters merely for the benefit of those engaged in the fishery, unless the fishermen who would reap the benefit were to pay at least the greater part of the working expenses. This could, no doubt, be indirectly managed by selling licences to fish lobsters. The Fishery Board have tried lobster-hatching at Dunbar, and are starting a hatching-enclosure at Brodick, Arran. I would propose that they also start a fishing-station, if they have not already done so, turning out the young lobsters on a suitable part of the coast, over which the Board would require to hold the exclusive right to fish lobsters. A few years would show what was possible in the way of lobster-farming. I would also suggest that matters be so arranged that parts of our territorial waters could be let at a really low rent for oyster-culture, as is done in France, or for lobster-rearing. Though the expense of hatching and rearing the young lobsters would not be great, yet the men who watched to prevent theft, and who carried on the fishing, would require for themselves the greater part of the profits, leaving little margin for other expenses.

In the meantime, however, before the steps being taken by the Fishery Board can have any practical result, I would beg to suggest three preventive measures which might surely be easily enforced.

1. A close time, on the lines already laid down, besides which certain areas of coast-line might be set aside as "lobster nurseries," on which no lobster should be taken for a period of years. These areas would require to be a mile or two in length, and to extend from mean low-water mark, or from the inner edge of the laminaria or oar-weed, out to a depth of from ten to twenty fathoms, according to the locality and the nature of the bottom.

2. Prevent the sale of lobster-eggs, except to *bona fide* hatcheries, unless attached to the female. Immense quantities of lobster-eggs are used annually for culinary purposes, decorating dishes, and colouring sauces, in London alone no less than 18 lb. weight of lobster-spawn, amounting to over 1,700,000 eggs, having been sold by a single dealer in two months. The danger is that unprincipled fishermen might strip the eggs from undersized hens, and, though the hens might be returned to the sea, the eggs would be sent to the fishmonger.

3. Increase the size below which lobsters may not be legally taken. The present legal size is 8 inches, measured from the tip of the rostrum to the end of the tail, when the lobster is spread as flat as possible. This limit is utterly absurd. There

is no doubt that the majority of lobsters sent to market at present are only half grown, most of the large ones having been caught up. I would suggest, increase the minimum size to 11 or 12 inches, and then the hens under the legal size would have an opportunity of hatching their young. I do not know at what size lobsters begin to spawn, but, from what I have seen, I doubt if those of 8 inches or under do so, at least to any appreciable extent. It is ridiculous to pretend that the Act of 1877 has put a stop to the taking of undersized fish; for what is a lobster of even 10 inches when brought to table, but a miserable apology for the full-grown article? A lobster under 14 inches cannot be said to be fully grown. No doubt they attain a considerably larger size if left alone. On the shore at low tide I have frequently taken lobsters over 14 inches in length and over 4 lb. in weight, while I have seen a lobster, caught in one of my creels, which measured 20 inches from the tip of the rostrum to the end of the telson, and weighed 6 lb. $\frac{3}{4}$ oz. On the table before me as I write are two claws, from two different lobsters which I caught among the rocks several years ago. I believe they have slightly shrunk, but they still measure, respectively, $9\frac{1}{2}$ inches and 10 inches in length, while the girth of each is 10 inches. These measurements of course include only the "propodite." They were the crushing claws of two fine male lobsters. The old idea that you may fish when, where, and how you like, without exhausting the supply, is happily becoming exploded. Several marine animals have of late gained legal protection, to save them for the use of man, and no time should be lost or pains spared to obtain protection for the lobster, and so save that beautiful, excellently edible, and valuable animal from the fate of the great auk and the dodo.

ON THE PRESERVATION OF THE LOBSTER.

By JAMES G. BERTRAM, 334 St Vincent Street, Glasgow.

HAPPILY, we are not now, as we were a few years ago, without figures of an authentic kind regarding the lobster-supply of the three kingdoms. The statistics of the catch of these much-valued crustacean delicacies of the table are, the writer is informed, "as correct as there is any need for"—that is to say, they may be a hundred short of the tale given, or even a thousand, as it is not possible to secure literal accuracy in any

one year; but for the purposes of the statistician, and as affording a basis for the comments of fishery and political economists, they are, if not all that can be desired, much better than none at all.

A very general idea prevails that lobsters were at one period greatly more plentiful than they are now; but although that may have been so—and we are not without proofs that such was really the case—the statements which are occasionally circulated regarding the former great abundance of these shell-fish must be taken with the proverbial grain of salt. Scotland, in particular, is named when a falling off in the lobster-supply is alluded to, and tales told by fishermen are still in circulation regarding the former abundance of that member of the great crustacean family on the rock-bound coasts of the land of “mountain and flood.” And it is within the knowledge of the writer that at various fishing-places the number of lobsters now captured, compared with the takes of thirty or forty years ago—when a large one could be purchased for a shilling, and on occasion for a smaller sum—is certainly much less.

Before endeavouring to arrive at the cause of the falling off in the lobster-supply, it may be as well to give the figures that record the captures of 1888-89:—

		1888.	1889.
Scotland	. . .	676,700	571,900
England	. . .	469,265	719,549
Ireland	. . .	131,384	407,650
Total	. . .	1,277,349	1,699,099

For the nine months ending with September 1890, the take of lobsters in the United Kingdom was 1,582,763.

A million of anything, no matter what, is a large number, and as it is not improbable that the lobster-supply of the present year may reach two millions for the United Kingdom, the question will no doubt be asked, If the supply could ever at any time have been greater? To that question it can only be replied that tradition says “Yes.” It is, however, somewhat unfortunate that “tradition” does not, in the case of this fruit of the sea, deal in statistics; as has been indicated, the figures pertaining to former supplies are probably somewhat imaginative, or at any rate unreliable, and are not therefore available for comparison with the statistics now compiled and published by the Board of Trade.

As the lobster is able to reproduce its kind by tens of thousands it has usually been taken for granted that “there should be no end to the supply;” but in respect of its powers of multiplication it must be considered along with other inhabit-

ants of the great deep. In the herring, for example, we have a fish which weighs only a few ounces, but (the female) is endowed with a power of reproduction which seems almost miraculous; the ova of some examples of these fish that have been counted running to the enormous figure of 40,000, and some fishing economists are of opinion that the herring, taking into account its fruitfulness, is scarce enough! It has been said, however, that if a couple of herrings and their progeny were to breed for a period of twenty years without molestation, the result would be a bulk of fish equal to the globe on which we live! Female codfish are known to be also furnished with an immense supply of eggs, literal millions in fact; but in comparison with their powers of reproduction codfish are far from being numerous. Other sea-fish might be named, such as turbot, which, taking into account their wonderful fertility, are even less abundant. A female salmon weighing 25 lb. will yield 20,000 eggs, but it has been calculated that out of that number not ten of those hatched will reach the table or become mature fish able to reproduce their kind!

The waste of fish-ova, and the very high rate of mortality incident to fish-life in the sea and also in rivers and lakes, are known only to those who have studied the subject or made minute inquiry into this phase of fishing economy. Hundreds of thousands of the eggs of the codfish, as well as of other members of the *Gadidae* family, are lost to the future, because they escape the fructifying power of the milt of their male congeners; other hundreds of thousands of ova, whether impregnated or not, become the food of other fishes; the young ones are also greedily pursued by enemies, to which they fall an easy prey, whilst many thousands die of starvation, not being able to find a sufficiency of food. This fact was early known to the Chinese, who are adepts at pisciculture, and who, taking advantage of this knowledge, keep up large stocks of fish by supplying food in liberal quantities to the young and helpless.

No exact figures relating to the fecundity of the lobster can be given, but that this animal has been liberally endowed with the power of reproduction is well known to naturalists. "Hens" (females) have been handled from which 20,000 eggs have been taken, and even more fruitful examples are occasionally captured; but as the "coral" takes some time to mature, it has never been accurately ascertained how many eggs one female can yield, for when a "hen" is captured in the act of giving out her "berry," it is not unlikely that she has been engaged in that process for several days. Besides, as the present writer said in another place, "the extent of lobster fruitfulness will, without doubt, depend on size; the larger the animal the greater will be the yield of ova, just as in the case of the salmon,

conger-eel, turbot, and other swimming fish, round or flat." Whatever may be the number of eggs contributed to the general supply by each female, and some naturalists have computed the number to be as much as 60,000, a vast quantity never even come to life, but fall a helpless prey to the battalions of fish which are always seeking for food.

"Over-fishing" has done much to diminish the lobster-supply in Scottish waters. To those places where these crustaceans were known to be plentiful, the fishermen came and captured as many as they could find, and as the traps were emptied, fish-bait was inserted, and they were set again. No restrictions of any kind were in existence at the period referred to—say thirty years ago and previous to that time—the lobster-catchers being left to their own discretion. It is not, therefore, to be wondered at, that in time these shell-fish became scarcer and scarcer; for however fruitful they may be, when man, the most skilled of all their enemies, steps in to capture them, and adds his force to the other influences so constantly and so industriously at work, it is nearly impossible for the most liberal spawning power to withstand the combination.

Not only, however, has the lobster been "over-fished," but that has been done in a manner that fishing economists have sternly protested against. It has been sought for and captured at the very time it has been occupied in repeating the story of its birth! "A lobster with its coral," said the late Mr Frank Buckland, one of her Majesty's inspectors of fisheries, upon one occasion, "is of double value," and to that fact must be largely ascribed any falling off in the number now taken as compared with the number supposed to have been taken thirty or forty years ago. Unfortunately it is still legal to capture these animals during their spawning season and while in coral; not only so, but it may be said that at the instigation of Mr Buckland an Act of Parliament was passed which authorised *gravid* lobsters to be taken and to be sold. In an article contributed to the 'Quarterly Review' on the subject, the writer of this essay characterised this feature of the Act of Parliament as a "concession to the cooks," which it undoubtedly is. It was thought by Mr Buckland and his coadjutor that it would be better to allow fishermen to capture and dispose of lobsters in berry openly, than that they should do so in a surreptitious manner, as, in consequence of the coral being valuable for cookery purposes, they would be sure to do.

It is painful even to reflect in the mildest manner on a gentleman who cannot now be called upon to defend himself, and especially painful in the case of Buckland, who in his day did so much good fishery work in the way of investigation and suggestion. But the truth must be told, that blunder of the

genial fishery inspector, that "concession to the cooks," has much affected the supply of lobsters. All the protection afforded to these shell-fish by the recommendation of Mr Buckland and his brother commissioner, who aided in an inquiry into the cause of the falling off in the number of lobsters then being captured, is simply a definition of the size under which they ought not to be taken, or if caught of smaller dimensions than the measurement prescribed, be restored to the water. The Act now referred to decrees that lobsters shall not be taken or sold which measure less than 8 inches from the tip of the back to the end of the tail; but the Act is said to be systematically disregarded—many smaller lobsters being daily brought to market.

The ~~deliberance~~ ^{deliberance} given by Messrs Buckland and Walpole on this ~~feature~~ ^{feature} of the reports given, and the recommendations made by them for the future conduct of the crab and lobster fisheries, may be here extracted. After referring to the difficulties that prevented them from recommending a close time they go on to say:—

"We are also unable to endorse the other recommendation which has been made to us—viz., that the sale of berried lobsters should be prohibited. In the first place, if it were illegal to take berried lobsters, it would not pay fishermen in many cases to pursue the lobster-fishery. In the next place, the lobster when berried is in the very best possible condition for food, and it would be as illogical, therefore, to prohibit its capture as to prohibit the taking of full herrings. In the third place, if its capture were illegal, Mr Scovell's evidence at Hamble shows that the fishermen would probably remove the berries. The berries would no longer be seen in the market, but berried lobsters would be killed as much as ever. Berried lobsters are, it must be remembered, especially valuable. The berries are in great demand for sauce and for garnish for fish and salad. We do not for one moment think that the views of professed cooks ought to influence legislation, or that our recommendations ought to be affected by the supposed requirements of the dinner-table. But it seems impracticable to make any legislation on the subject—first, because it is not desirable to deprive the public of a large amount of valuable food and the fisherman of a considerable portion of his profits; and second, because the prohibition of the sale of berried lobsters would lead to the removal of the berries. We recommend, therefore, the institution of a gauge as the only remedy universally applicable for the improvement of our lobster-fisheries."

It may be permitted to make a passing remark on the observation that "the lobster when berried is in the very best possible condition for food." The writer takes leave to doubt

the statement. He never saw a berried lobster in good condition, and the crab when gravid becomes poor and lean; and as regards fish proper, one has but to look at such as are captured during the period they are engaged in spawning to see that they are unfit for the table. About that time all their fat flesh-forming properties are required for the maturing of their ova and milt. In direct opposition to the deliverance given by Messrs Buckland and Walpole, another writer says: "It is a common mistake to suppose that a berried hen is always in perfection for the table; when her berries appear large and brownish, she will be found exhausted, watery, and poor."

Having now stated the chief provision of the measure passed by Parliament for the protection of these animals and given the reasons advanced for passing it, it only remains for the essayist to recommend that the said Act should be at once repealed. Till Mr Buckland's blunder be corrected, the lobster will never become plentiful. The loss of spawn from natural causes cannot very well be remedied, but it is surely possible to stay the hand of man and to declare the sale of "berried hens" illegal. What would have been said, for instance, had the salmon been refused protection during its breeding season because anglers consider the roe of that fish to be a bait which no trout is able to withstand? If millions of the ova yielded by the female lobster are annually sold for cookery purposes, it is not an unreasonable conclusion to arrive at, that a certain and considerable percentage of decrease in the supply must result. That the decrease will therefore become larger year by year needs no argument to prove. With the regulation as to size disregarded, and the sale of coral not illegal, it stands to reason that this member of the shell-fish family is in a perilous condition. Had a close time been enacted in its favour, and the sale of spawning lobsters made a punishable offence, the public would not at present be lamenting their scarcity.

The usual remedy now suggested in the decreasing supplies of fish, oysters, and crustaceans is "pisciculture,"—in other words, "aided breeding"; and that it will be possible in time to adapt piscicultural practices to the breeding of the lobster need not now be doubted. They have already, in fact, been tried with more or less success. In one case Mr F. M. Wallem stated at one of the conferences held at the great London Fishery Exhibition that an experiment of the kind tried in Norway had failed. "We have tried," said that gentleman, "to hatch and cultivate the lobster, but have not succeeded, not having been able to keep the hatched young ones alive more than a few days, then all of them disappear, leaving no trace to tell how or why they disappeared." Later experiments made in Norway, however, have proved more successful, Mr G. M. Dannevig having been able to keep the fry alive for several weeks, in the

course of which they moulted five times. The eggs experimented with were obtained from the fishermen, who simply collected them from the spawning hens. The mortality which takes place in what may be termed "artificial" hatching, is stated by Mr Dannevig to be very great, but not so great, perhaps, as the normal rate of mortality incident to natural hatching in the great deep. The following note by Mr Dannevig, bearing on the subject, may be thought interesting: "If the question were as to whether it would pay to catch the lobsters for hatching purposes, hatch the eggs artificially, and liberate the fry immediately after hatching, I should answer that it would not pay, as the lobsters themselves can do the hatching much better than the best of human inventions. If after the hatching we could rear them for at least six weeks, then I think it would pay; for although the losses in the apparatus are heavy, I believe they would be still larger in nature. But the immense number of eggs attached to the lobsters that are brought to the market, which naturally would be destroyed, should be hatched, and the fry reared for a short time, if possible, as either hatching alone, or hatching and raising, is better than destruction."

It would savour of wisdom to put an end to that destruction of lobster-spawn which is so marked a feature of the fishery. It is not going too far to assert that in the course of a year millions of berries are annually sent into our kitchens; this is well known to those who have made inquiries. As an illustration of this fact, a London boiler of crustaceans told the writer that in the course of three months he collected 22 lb. weight of coral, which represented a million and a half of eggs. "Remove, then, the cause, and the effect will cease," may surely be said of this feature of lobster-fishing economy; make the capture of "berried hens" illegal, and decree punishment to all who sell or *purchase* "coral," and thus allow nature to obtain the chance which she never has had hitherto, of adding to our stock of lobsters. It has been contended by some fishery economists, that as many of these crustaceans are taken with spawn as are left to spawn in the waters, the hope might be indulged that in the course of a few years our supply might be very largely increased. It is believed that lobsters do not reproduce their species till they have attained the age of five years, and that young breeders are not nearly as fruitful as those that have attained that age and above it.

It would be possible to enlarge the foregoing remarks; but in the opinion of the writer the suggestions given ought to be taken advantage of. "It is never too late to mend," and holding that opinion, the first thing to be done in order to augment the supply of lobsters is to repeal Buckland's Act, and make the capture of "berried hens" illegal.

GENERAL SHOW OF THE HIGHLAND AND AGRICULTURAL SOCIETY, HELD AT DUNDEE IN 1890.

THE Sixty-third Show of the Society took place at Dundee on the 29th, 30th, and 31st July and 1st August 1890. The Society had met at Dundee on a previous occasion—namely, in 1843.

The General Meeting of Members was held in the Pavilion in the Show-yard at 11.30 on Wednesday 30th July, and the President's Dinner took place in the Queen's Hotel at 7.30 the same evening—Mr M'Queen of Crofts presiding at the former, the Earl of Strathmore at the latter.

The following remarks regarding the stock are taken from notes by the judges:—

CATTLE.

Shorthorns.—The shorthorns were about the poorest display ever seen at the Society's Show, owing, no doubt, in a great measure to certain restrictions which prevented many exhibitors from showing. Four aged bulls competed in the first section, none of which gave one the idea of a high-class shorthorn. The winner of the first prize certainly was a heavy beast, high on the leg, hard handler, and about as much hair as an elephant. The second had more shorthorn character, but had a weak back and loin, and shown out of form. The third was a heavy bull that looked almost as much like a Hereford as a shorthorn. In the second section the winner was a fairly good bull, with many good points, but would not win in high-class company. He was superior to any shorthorn bull shown, and consequently was awarded the silver medal as the best bull in the three sections. In the yearling bull section the winner was the best of a bad lot. The show of females was much better than the males. The first-prize winner in each section was good enough to hold its own in any company. The two-year-old heifer was the truest and most perfect formed shorthorn that appeared in a show-yard this season. Beyond the prize-takers there was nothing worth noticing.

Ayrshire.—The section for aged bulls was above average, the winner of the first prize being an extra good animal. The two-year-olds were an average lot. The yearling bulls were a large, grand section. The cows in milk were a moderate lot, and those in calf an average section. The two-year-old heifers were a very good lot, the winner of the first prize being quite a

model of an Ayrshire. The yearling heifers were a large, grand section.

Aberdeen-Angus.—Keeping in view the fact that, owing to the existence of pleuro-pneumonia in Aberdeenshire, several animals entered were prevented putting in appearance, the Society must feel gratified with the numerically strong position taken, and the very high standard of merit displayed by the exhibits embraced in the different sections devoted to this breed. In the section for bulls calved before 1st December 1887, there were thirteen entries—one absentee. Dealing with the exhibits in this section in the aggregate, it is questionable if a better lot of aged bulls were ever seen together, and, while the first and second prize bulls were animals of outstanding and exceptional merit, any one of the four animals placed would make a creditable first on an average of years. The special prize for the best male of the breed was without hesitation awarded to the first-prize bull in this section. In the section for bulls calved on or after 1st December 1887 there were ten entries and three absentees. The first and second prize bulls were first-class animals. In the section for bulls calved on or after 1st December 1888, there were fifteen entries and three absentees. The winner of the first prize in this section was of outstanding merit, while the other placed, and the class as a whole, can be characterised as very meritorious and promising. The section for cows calved before 1st December 1886 consisted of fifteen entries and two absentees. The first-prize animal in this section was of a high standard of merit. The animals to which second and third prizes were awarded were of great substance and weight, with quality combined. The section for three-year-old cows consisted of twelve entries and four absentees. The animals to which first and second prizes were awarded were of outstanding merit, of almost faultless symmetry, covered with wealth and evenness of flesh. Without hesitation the special prize for the best female of the breed was awarded to the winner of the first prize in this section. The section for heifers calved on or after 1st December 1887 comprised fourteen entries and three absentees. The animal awarded the first prize was an easy winner in this section. For heifers calved on or after 1st December 1888 there were twenty-nine entries, eleven absentees. The winner of the first prize was of outstanding merit; the other animals placed, as well as those not so dealt with, were all very meritorious and promising animals.

Galloway.—The entry of Galloways was fairly numerous, but the display, both numerically and in respect of merit, suffered from the absence of the animals entered by the Duke of Buccleuch, and by the fact that cattle were not admitted from Cumberland. Two excellent aged bulls competed which in

previous years were conspicuous in the show-rings on both sides of the Border. In the two-year-old section were some very promising animals. The yearling bulls were a superior promising lot, and no doubt will be seen again in the show-yard. The Galloway females were on the whole superior to the males,—the prize-takers exceptionally good. There were a number of excellent cows in that class. The two-year-old heifers were also specially good. In the yearling heifer class the prize animals were a very fine lot, and the section included several other meritorious youngsters.

Highland.—Dundee being conveniently situated to Perthshire, the renowned centre of the shaggy breed, the show of Highland cattle was large and magnificent. In the section for aged bulls it was satisfactory to find several of the three-year-olds easily securing the coveted tickets over their older rivals. Though fewer in number, among the two-year-olds were animals of very high merit. The section of cows was a full average, both in number and quality. Three-year-old heifers were numerous represented, and of more than usual excellence. Two-year-old heifers were a very large section, and among them were many specimens of careful breeding.

HORSES FOR AGRICULTURAL PURPOSES.

Stallions and Entire Colts.—The show of stallions and entire colts was much above the average of several years past. The aged section was for the time of the year well filled with a useful lot of sound good horses. The first and second prize-winners were considered ahead of the others in the class; and while there might, as they appeared before the judges, be some argument adduced in favour of reversing their positions, on the whole it seemed that, all things considered, they were rightly placed. The three-year-old stallions, while more numerous, were barely characterised by so much general excellence as the aged horses. The first was a horse that may safely be depended on to give greater satisfaction the longer he is exhibited. He is a horse of very rich and fashionable colour, and will wear well, sound in feet and limbs, and nicely turned in body. The second horse was an animal of great substance, which would probably be more highly thought of in the South than in Scotland, where his colour—the unpopular chestnut—will create a prejudice against him. The third horse was beautifully formed in every way, but did not move so freely as one would wish. Two-year-old colts as a class far surpassed either of those that preceded them. All the prize-winners were, without exception, animals of very high caste. The first-prize winner was never before exhibited. He was a

very handsome big horse, with sound feet and limbs, and weight and substance. He was followed by a richly coloured grey horse, with much promise for the future. The horse which followed him was a big solid horse, and a good mover, but longer than most horses. A beautiful horse was placed fifth. The sixth was a grandly coloured, big horse. Yearling colts were *par excellence* the show of the show. They were alike numerous, and of surpassing high merit, showing both strength and quality. Many very fine young horses got no ticket, as it was impossible to commend all. The first-prize colt was one of the best of his class that we have ever seen. He was awarded the championship as the best male Clydesdale, an award made with the clearest conviction of its soundness. The second was got by the first-prize aged horse Prince of Albion, and was a horse of good balance of merit, likely to improve with age. The third was a nicely turned horse, of well-balanced merit. The fourth had good feet and pasterns, and will grow into a big, heavy, solid horse. The fifth was a very powerful big horse. This horse is likely to take a high place amongst Clydesdale sires. The sixth was a more evenly balanced horse, but lacks the weight and substance.

Mares and Fillies.—The mares and fillies were of superior quality all through. The brood mares were not very numerous, but those gaining prizes were quite up to the average of former years. In the yeld mares, the first and second prize animals were of exceptional merit. Taken as a class, the three-year-old mares were the most uniform. The younger sections were also very good, and among those shown were many animals of great promise. The success of the renowned breeding-horse, Prince of Wales (673), is to be here noted—the first-prize two-year-old and first-prize yearling being both sired by him. The show altogether points to a decided improvement in the breed of Clydesdales.

HUNTERS, ROADSTERS, AND PONIES.

The classes for hunting-stock at Dundee were decidedly disappointing, and not such as might be looked for at a National Show. The roadster and hackney classes were better, but do not call for special commendation; while the pony classes as a whole were good.

Following the order in the catalogue, the first class adjudicated upon was—

Hunters, four years old and upwards, without reference to weight.—The first-prize animal was a useful horse, up to weight, and well bred. The second prize was a nice horse on smaller lines, and not up to the same weight as the winner. The third prize

was a well-bred five-year-old mare, good-looking, and a fair specimen of a medium-weight hunter.

Three-year-olds contained some good specimens. The winner of the first prize was a chestnut filly of good style and quality. The second, of same colour and set, was a very useful mare of greater substance than the winner, but lacking her quality, and rather long in the leg.

Two-year-olds.—The winner here was a fair colt, not likely to make a weight-carrier, but a good horse of his class. A roan mare won second prize—very useful, with good action, better adapted for the road than the field.

Though not in catalogue order, the special section for yearlings, the produce of Queen's premium stallions, may be inserted here, as owing to the donation of these prizes the Society had no open section for half-bred yearlings. There were nine entries, and the class was a very encouraging one, though it is to be regretted that only the produce of one of the premium horses was exhibited. The horse referred to is Royalty, the Fife district stallion. The stock brought forward was above the average of such classes as generally seen at Scotch shows, and, being all of one sire, was specially creditable. A general characteristic seemed to be free, fairly high action, always desirable in the general utility horses these premiums are understood to be intended to encourage. The winner was found in a bay colt, likely to make a valuable hunter, and he was closely followed by another bay and a very taking chestnut of less substance but full of quality.

Hackneys in Saddle was a superior one. First prize fell to a particularly nice chestnut gelding full of quality and handsome, with good action and very perfect manners. A dark-brown five-year-old mare was recipient of second honours; well bred, and a pleasant hack for a moderate weight. Third prize went to a good chestnut mare moving well. In this class there were several useful animals, with high action and apparently of Norfolk descent, but in the opinion of the judges better adapted for harness than saddle.

Hackneys in Harness.—This contained some good horses. The winner of the first prize was a handsome, powerful mare with superior action; and the second animal was very much of same type, and not much inferior to the winner. The third prize had been a fine mare, and still retained her grand action.

Stallions under 15 hands.—The winner was a very handsome chestnut of true hackney type. The second-prize animal was also a good cob of old-fashioned stamp.

Ponies between 13 and 14½ hands.—The winner here was a handsome black hackney mare. A good bay mare was second.

Ponies between 12 and 13 hands.—The winner was easily found in a bay mare of beautiful style, with fine action; a very smart piebald gelding taking second place.

Ponies under 12 hands.—The first, second, and third were three attractive ponies, bay, chestnut, and cream-coloured, and won first, second, and third prizes respectively.

Shetland Stallions and Mares contained some very handsome and characteristic specimens of the breed of the very small type now so much sought after.

In the extra section the only animals calling for special mention were Duke of Norfolk, a Norfolk stallion of good substance and grand action, and Mars, the well-known pony stallion, so frequently a winner at the Society's Shows as to require no description here.

SHEEP.

Blackfaced.—The aged tup section was very good indeed, and the same may be said of the shearlings. Although there were a few in the latter section not quite up to show form, as a rule they were very good, and the first-prize sheep was undoubtedly an exceptional specimen of the breed. Ewes and gimmers were also a grand show, and very closely contested. They could in no way be considered inferior to the male classes.

Cheviot.—The show of Cheviots was good, although sheep of outstanding merit were scarce, more especially considering the district of show, where no local breeders are resident. Now that the principle of one judge has been conceded by the Directors, it is hoped that the battle between east and west coast breeders will cease, and uniformity of type introduced by breeders of Cheviot. We do not require a large sheep with open skin of Leicester quality, or the small cock-legged type, rabbit size, however well woolled, often with last year's fleece, with a saddle back. Breeders and feeders, as well as consumers, require and demand a medium-sized well-woolled sheep, with the still well-known characteristics of the breed. The quality of wool should have more attention. As is well known, breeders can clothe their sheep with the kind most in demand at the time, but must also recollect that the very fine description, though high in price by the pound, never pays rent.

Border Leicester.—The Border Leicester sheep formed a splendid turn-out in all the four sections—namely, aged tups, shearlings, ewes, and gimmers. Amongst the aged tups there were many very fine specimens of the breed; but shearlings were forward in greater force, there being in this section no fewer than thirty competing, and these with only a few exceptions being mostly sheep of good style and quality. There

were only five pens of ewes exhibited, the deficiency in numbers being more than made up for by the splendid quality of this whole section, in which were animals conspicuous for their strength, symmetry, and massive proportions. Gimmers were more numerously represented, and taken as a class were the finest all through of the Border Leicester sections. It is rare indeed that there is such a fine turn-out in this class, breeders naturally grudging to risk spoiling the gems of their flocks for breeding; and that there is a considerable amount of risk in feeding up breeding animals for exhibition, no one will deny.

Shropshires.—Shropshires were well represented, and contained some first-class specimens of the breed. In old tups the three prize-takers were good sheep and should be valuable ones. The first-prize shearling tup was of true Shropshire character, having beautiful quality of wool and flesh, but was hardly masculine enough. The other winners in this class were nice sheep; the third-prize one was rather backward in condition, but had a beautiful head, and was altogether a stylish sheep and one likely to be heard of again. In shearling ewes the first-prize pen contained three very long ewes with nice heads, good wool and flesh, and beautiful pink skins. The other winners were hardly so matched as their more successful rivals. The two prize pens of aged ewes were a credit to any flock in any country.

Oxford Downs.—The Oxford Downs were a poor show in point of numbers, but the prize rams were very good representatives of their breed. The winning gimmers were a very nice pen.

SWINE.

The first and second prize large breed sows were very good specimens of the breed, and although the first prize one was showing signs of age, yet she well deserved her place. There was nothing worthy of special notice amongst the other exhibits in the large or middle breeds. Berkshires were a much better show all round, and although there was perhaps nothing of the very first order amongst them, yet as a class they were much better than the whites, and taken all over were a very useful lot.

POULTRY.

The provision for poultry made by this Society as regards the shedding and attendance was such as is not surpassed by any other in the kingdom, the sheds being almost fit for permanency, and in all is a boon that should be valued by exhibitors. True,

the duration of the show is long for young birds, but with the attention bestowed here, no birds can suffer from the four days' confinement, and only a fastidious feeling of reluctance to risk young stock for so long can prevent owners of birds from sending more freely.

Dorkings rightly headed the list, these having now almost assumed the importance and position of a national breed, for nowhere can they be produced in greater perfection than north of the borders; and these were well represented—the silver greys especially were good in shape, size, and feather, and at no other show in 1890 have we found them so good, and the most encouraging feature is, that the young birds were far ahead of the old ones. Cochins and Spanish were little less than a failure, while the Brahmapootras were fairly good. Scotch Greys were very good in old birds, and the Hamburgs were a nice lot all through; Game and Bantams being represented by a few choice pens. The aquatic section was a very good one, and would have done credit to the largest summer show ever held, the quality of the Aylesbury ducks being of a high character, while the Rouens (though of course out of feather) showed great bulk of frame, and the Pekins were also a good lot. Geese were well represented, the Toulouse standing well out, and at once large in frame and fine in outline, and there were also a few correct white Embden. Taking them all round, the turkeys were quite equal to anything shown, and the competition was unusually keen. One thing which struck us most forcibly was, that the most substantial and useful breeds stood well to the fore; and this is most gratifying, and as it should be in connection with agricultural societies.

DAIRY PRODUCE.

The cheese and butter shown was of a fair average quality. Of the former there was only one lot decidedly inferior. At this early period of the season, we do not expect to see the quality so developed as to be able to say what the cheese will be when properly matured. Butter was as a whole fine, but there was, as is usually found at all shows, two or three lots of very poor quality.

IMPLEMENTS.

There was quite an average show of implements, but there was nothing special to notice. The Society had selected grist-mills for trial, and they will be specially reported on. Exhibitors appeared well pleased with the show in a business point of view, and it is believed that a considerable amount of sales

took place; but great complaints were made of the dust of the show-ground, and the difficulty experienced in keeping the exhibits clean.

HIGHLAND INDUSTRIES AND FISHERIES.

Owing to the interest taken in the Highland industries by some ladies in the north, there were fifteen entries for home-spun and home-dyed yarn and hand-knitted stockings.

The exhibition was most satisfactory, and the judges were greatly pleased with the excellent quality of the yarn, and also with the even elastic and yet firm knitting of the stockings.

It was to be regretted that the exhibition did not include other articles besides yarn and stockings; but a good start has now been made, and it is to be hoped that at future shows there will be larger entries.

There were no entries in the Fisheries department.

The Exhibition consisted of the following entries in the different classes:—

CATTLE.

	Bulls.	Cows.	Heifers.	Oxen.	Total.
Shorthorn	20	5	16	...	41
Ayrshire	14	14	18	...	46
Aberdeen-Angus	38	27	43	...	108
Galloway	12	10	19	...	41
Highland	24	13	27	...	64
Extra	...	3	3	4	10
	108	72	126	4	310

HORSES.

	Stallions.	Entire Colts.	Mares.	Fillies.	Geldings.	Total.
For agricultural purposes	9	64	14	41	...	128
Yearling, the produce of the } Queen's premium stallion	...	5	...	2	2	9
Hunters and roadsters	...	...	26	...	18	44
Ponies	4	...	13	...	9	26
Shetland ponies	7	...	6	...	2	15
Extra horses	7	...	2	...	1	10
	27	69	61	43	32	232

SHEEP.

	Tups.	Ewes.	Gimmers.	Lambs.	Wethers.	Total.
Blackfaced	36	15	18	15	...	84
Cheviot	30	12	12	12	...	66
Border Leicester	40	15	39	...	...	94
Shropshire	19	12	27	...	...	58
Oxford Down	7	6	12	...	...	25
Extra section	...	...	...	...	69	69
Extra	1	5	3	2	3	14
	133	65	111	29	72	410

SWINE.

	Boars.	Sows.	Pigs.	Total.
Large white breed	1	3	9	13
White breed, other than large	2	2	3	7
Berkshire breed	3	8	9	20
Extra	1	1	3	5
	7	14	24	45

	Entries.
POULTRY	271
DAIRY PRODUCE—	
Butter	72
Cheese	18
IMPLEMENTS (138 stands)	1552

The following is a comparative view of the exhibition of stock, poultry, dairy produce, and implements, the premiums offered, and the receipts (gate-money and catalogues) of each of the Shows at Dundee:—

Year.	Cattle.	Horses.	Sheep.	Swine.	Poultry.	Dairy Produce.	Imple-ments.	Premi-ums.	Re-ceipts.
1843	317	73	324	30	34	31	101	£990	£900
1890	310	232	410	45	271	90	1552	2153	2837

ON THE PINK-EYE INFLUENZA.

By WILLIAM WILLIAMS, F.R.S.E. and F.R.C.V.S., Principal of the
New Veterinary College, Edinburgh.

THE term "Pink-eye"—an importation from America—is vulgarly applied to an epizootic disease affecting horses, from one of its inconstant symptoms being redness of one or both eyes, with swelling of the eyelids.

Some suppose that it is a new disease, and that it first appeared in America in 1872—the actual seat of its outbreak being Toronto, Canada, where it appeared on 1st October 1872. In nine days it had attacked nearly all the horses in the city, and carriages could not be had at any price. On 18th October it had reached Montreal, and was prevalent throughout Canada. On 14th October it had reached Buffalo; 17th, Rochester; 22d, Boston, New York, Brooklyn, and Jersey city; 27th, Philadelphia; 28th, Washington; and had been witnessed in Nova Scotia as early as 13th October. One remarkable circumstance is related in connection with this outbreak, and which, if correct, disposes of the "contagion only" theory of its origin, by Mr Greene, M.R.C.V.S., of St John's, N.B. He says: "I was always under the impression that the influenza was both contagious and infectious till the late outbreak. Since then I have altered my views with regard to the contagious and infectious nature of that disease. One among several facts which I could mention will bear me out on this question.

"During the month of July 1872, a horse had been put to grass on Partridge Island, in the Bay of Fundy. This island is three miles distant from this city. No other horse had been near the island from the date of his landing up to the time of the outbreak in St John's, N.B.; and on the 15th or 16th of October, which was only two or three days after the first case was reported in this city, the horse on the island was affected with the most virulent form of the epizootic."

In 1871-72 influenza was in London, of a very severe but not very fatal type.

Amongst the older writers we find the disease described by Apsyrtus, a Greek veterinarian who flourished in the fourth and fifth centuries. His description is very good indeed. He says: "When the horse sickens from fever he carries his head heavily, and as if immovable; the eyes are swollen, and he can scarcely open them. The lips and all the body are flaccid, the testicles pendent, and the breath and body have a burning heat; he fixes his limbs and is insensible to blows, and when compelled to walk he is every moment likely to fall."¹ Other

¹ Fleming's Animal Plagues.

writers of this period refer to it under the term "Fever of the horse."

It prevailed in Italy in the fourteenth century (Dieckerhoff), and a plague amongst horses is described, A.D. 1328, by an Arabian chief of Yemen in 909 of the Hegira, and entitled *Kitab-el-akouâl*, but from his description it must have differed from the present disease, being much more suddenly fatal. It is thus described: "The epizooty that attacked the horses of Yemen in the year of the Hegira 728, was of the worst character, and was rapidly mortal. No one knew how to recognise or characterise it, and in no books or hippiatric treatise of past ages could any distinctive traces of it be found mentioned. No efficacious remedy could be derived to cure it. The animal attacked was not allowed to benefit by medical or any other kind of treatment. This malady had not, like other diseases, any premonitory symptoms. It suddenly struck the animal, which perhaps would be eating, and all at once something escaped from its nostrils like mucus; for a moment the horse's head was drooping on the ground, from which he had no longer strength to raise it, and then he fell dead. Sometimes he struggled for a few seconds before he expired. The malady first began in the kingdom of Hadramût, then it was propagated into Yemen, and as far as Mecca, killing an incalculable number of horses. Mules also died in great numbers, but not so extensively as the horses." If this is the disease referred to by Dieckerhoff, it is presumable that he has confounded what seems to be anthrax with influenza; at the same time it must be confessed that occasionally horses die with scarcely any premonitory symptoms from influenza even at the present day.

Solleysell, a French veterinary author of great repute, observed and described it in 1648, and Kanold in 1711.

During the eighteenth century a widespread febrile disease in horses was observed, which was doubtless identical with "Pink-eye," and Havemann described it in 1796 under the term *Fanffiebersenche* (putrid fever disease), and an extensive outbreak occurred in 1804-5; and in 1848-49 the writer remembers an extensive outbreak in England of a disease having most of the symptoms of what was witnessed in Edinburgh this last winter, 1890-91; and in 1870-71, as already indicated, it prevailed over the greater part of Europe, and a new outbreak occurred in 1881.

The last outbreak of the disease seems to have appeared in Leeds in August, London, Manchester, and Edinburgh in September 1890. It disappeared from the practice of the College in February 1891, being succeeded by the pulmonary or chest form of influenza.

So much, then, for the history of the disease commonly known as Influenza, under which title are included at least three affections which prevail as epizootics in this country—namely,

catarrhal fever, Pink-eye, and epizootic pleuro-pneumonia, or the so-called "chest influenza."

Various writers look upon the three as separate diseases, whilst others consider Pink-eye to be a modification or an irregular manifestation of catarrhal fever, there being prominent symptoms common in both. So long as I can remember, the ordinary manifestations of the disease were swelling of the eyes and eyelids, swelling but no great pain in the limbs, with cough, more or less hurried breathing, and discharge from the nostrils: as years went on, the catarrhal symptoms (cough, &c.) became less prominent; but up to the present outbreak cough and irritation of the respiratory mucous membrane still remained to some extent, whilst the pain in the limbs and the great muscular depression have gradually increased in severity. From these facts, I am disposed to arrange the disease as an irregular manifestation of catarrhal fever, but probably distinct from the chest influenza—*i.e.*, epizootic pleuro-pneumonia of the horse.

CAUSES—ETIOLOGY.

Some writers maintain that it arises from contagion only, but there are many facts against this exclusive view. 1st, Its sudden and simultaneous occurrence in various parts of a district or city. For example, a place may be entirely free from the disease one day, and upon the next outbreaks will occur in many and widely separated spots in that place. 2d, Its occurrence in isolated places where contact with diseased animals is out of the question. For example, the first appearance of the disease in 1880 was at a farm in the Lothians, at least a mile and a half from a railway station, and during the spring, when all the horses were kept at home ploughing. In a few days it was in Edinburgh and in many centres; but whilst the writer is convinced that it occurs as a malarial disease, he is equally convinced that it is highly contagious and infectious, and can be conveyed from diseased to healthy animals with great facility. Dieckerhoff says it may be readily communicated to healthy horses by the intravenous or subcutaneous injection of warm blood taken from a diseased animal; and Mr Archibald Robinson, F.R.C.V.S., Greenock, states that it has been transmitted by the stallion, which has had the disease months before, to the mare by the act of coition.

A purely infectious disease like the pleuro-pneumonia of the ox follows the great lines of commerce, and can be traced from place to place with a certain degree of exactitude; but a miasmatic disease, which may afterwards become infectious or contagious, cannot be followed from place to place. I am therefore forced to the conclusion that, like the roman, and typhoid fevers in man, this disease, arising as it does from the en-

trance of a microbe into the animal system, is not due so much to that germ itself, but to certain properties which it has obtained from perhaps unknown conditions of the air; that the germ itself is constant in the surroundings of animals, and under ordinary conditions quite innocuous, but let those conditions be altered, the properties of the germ become virulent and infective.

There are several examples of the so-called spontaneous development of an afterwards contagious disease, tetanus being one of the most remarkable; and the same may be said of anthrax, which commonly originates without any contagion, and indeed when developed in one animal is only infectious to others by inoculation.

Now it appears that the infectious properties of the germ are generally developed during or immediately after a long continuance of wet weather. Three outbreaks within my memory have been so ushered; but this is not universal, as some writers state that it occurs in all weathers and in all climates. This might be more correctly said of the catarrhal form than of the other.

Before giving a description of the microbe which I have cultivated from the blood of animals suffering from this disease, and which in all probability is its cause, I may state that it (the disease) has a variety of names originating in the most prominent symptom of each individual outbreak—viz., “typhoid mucosa,” from the prostration and involvement of mucous membranes, and tendency to purge; “French distemper,” from its supposed importation from France; “epizootic cellulitis,” from its causing inflammation of the cellular tissue; “pneumo-enteric fever,” from the rapidity of breathing; abdominal pain, and mucus-covered faeces, &c.

The microbe (figs. 1 and 2) which I have invariably discovered is a micrococcus found in the fluid effusions of the connective tissue, and capable of being cultivated in nutrient media by inoculations with the above fluids or with the blood; it grows rapidly at a warm, but very slowly at ordinary temperature; does not liquefy gelatine, and seems to be particularly free from admixture with other organisms. The growth is white at first, but after several weeks it becomes slightly chromogenic, assuming a faint orange tint.

When requested by the Society to prepare this paper, I addressed a circular to about 100 of my professional brethren in various parts; and it is agreed upon by all who honoured me with a reply, that the disease attacks all breeds of horses alike, if kept under similar conditions—*i.e.*, when numbers are kept together—and that it very rarely attacks a horse a second time during the same outbreak.¹

The symptoms are as follows: some degree of lassitude; hot

¹ Mr Mason, V.S., Leeds, records one horse having been attacked three times during the late outbreak.

forehead; more or less failure of the appetite; the animal is inclined to be sluggish; his movements are clumsily performed, and he is inclined to "trip" with his toes; the eyes are heavy,

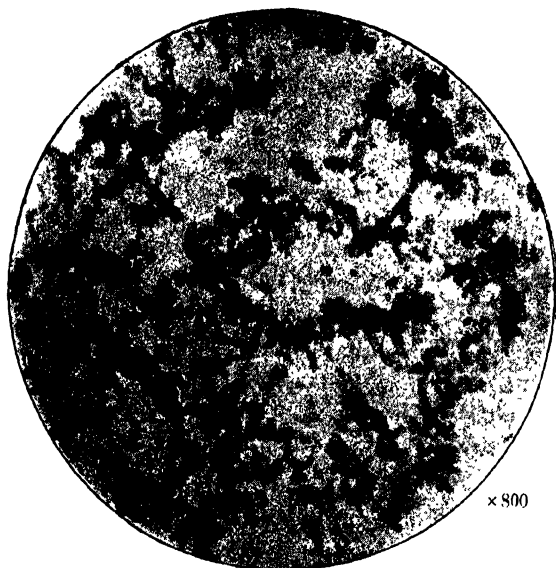


Fig. 1.—The Microbes in groups.

eyelids partly closed, in many cases some increased redness, and some swelling of eyelids, with a discharge of tears over the face, and sometimes opacity of the cornea, and fibrinous clots in the aqueous humor of the eye.

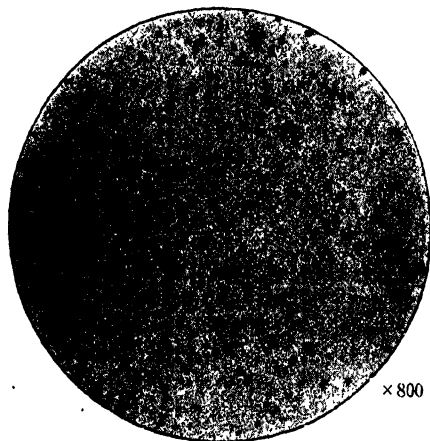


Fig. 2.—The Microbes are mostly in pairs—Diplococci.

If examined at this stage the temperature may be from 102° to 104°, or even 105°; the pulse from 60 to 70 per minute; respirations not much hurried. And if the horse be stopped from all work at this period, the severity of the disease

may increase but very slightly, and recovery may be expected in the course of a week or nine days; but if the animal be kept at work, or, even if not working, in a badly ventilated or other-

wise improper stable, the symptoms rapidly increase in severity, the temperature rises to 106°, 107°, or even as high as 108°; the respirations hurried; the pulse, increased in frequency to 80 or even 110 beats per minute, is small, and sometimes almost too indistinct to be felt by the most practised touch; the animal becomes excessively lame, sometimes immovably so, or he is continually resting or pointing one foot and then the other, as if suffering agony in feet or limbs, and there are often unmistakable signs of headache cranialgia. In a short period of time the limbs begin to swell, more particularly about the lower joints—i.e., the hocks and knees downwards—and as the swelling becomes pronounced, the pain disappears.

As already stated, there is usually a cough, and some degree of roughness of the throat and bronchial tubes; but in the last outbreak in Edinburgh these symptoms were absent.

In some instances intestinal pain—expressed by restlessness, looking round at the flanks, scraping with the feet, and even rolling about—is present shortly after the first manifestation of illness; and in others—and these are the really dangerously fatal ones—well-marked signs of inflammation of the bowels are observable at an early stage, with intermittent action of the heart, and total loss of appetite, or even extreme abhorrence of food, and occasionally of water.

The bowels are at first normal or slightly constipated; the fæces covered with mucus (hence the terms *Typhoid mucosa* and *Muco enteritis*), and their colour frequently indicates an absence of biliary secretion or the presence of altered bile; the rectum is often irritable, and the passage of fæces causes some degree of pain; on the third or fourth day the fæces become pultaceous, and often of a brown colour, and later on diarrhœa may occur.

In other cases, extending from the third to the sixth day of the disease, serious pneumonic symptoms are observed; there is an extensive exudation into the lung tissue; in fact, what is observable as taking place in the extremities—viz., exudation and swelling—is occurring in the lungs, causing the respiratory movements to become greatly accelerated; but if gangrene does not set in, indicated by fœtor of the breath or discharge of dark-coloured blood from the nostrils, recovery may still be hoped for.

In other instances, even during convalescence, the pulse, hitherto moderately strong, and all other symptoms passing away, becomes gradually and rapidly feeble, and the animal suddenly dies; and on making a *post-mortem* examination, firm clots or thrombi have been found in the heart, lungs, and blood-vessels, which have stopped the circulation and caused death.

This termination has to be very carefully guarded against, as it may occur in the most promising cases. It is brought about as follows: The disease is one which particularly attacks areolar tissue; and inflammation of this tissue, like that of the more firmly fibrous, causes the development of coagulating

properties in the blood ; and added to this coagulative tendency, the heart loses its tone, the blood coagulates in its cavities and blocks the circulation. In other instances, horses have died weeks or even months after they have passed through the disease, and *post-mortem* examinations have revealed plugging of the vessels of some important organ.

Another rare complication is witnessed by symptoms of irritation of the brain and its membranes, and effusion into the ventricles and sub-arachnoid space. As this complication manifests itself, there will be at first delirium, the eyes staring, the pupils dilated, perhaps complete blindness, with unconscious restlessness, tendency to elevate the head, followed by paralysis, commencing in the hind limbs, and extending to the whole muscular system, with total blindness, unconsciousness, stertorous or snoring breathing, inability to swallow, and loss of voluntary movements. These conditions indicate a rapidly approaching fatal termination. To recapitulate. The symptoms may be briefly stated to be as follows:—

Swelling of eyelids, often with diffuse redness of the conjunctiva—inner lining of eyelids—congestion of the superficial vessels of the eyes, cloudiness of the cornea—front of eye—and collection of yellowish fibrinous matter or blood-clots in the anterior chambers of the eyes. These clots are indicative of grave cases.

Sensitiveness to light, eyelids more or less closed, and discharge of tears ; but in the milder cases the eye symptoms may not be very distinct.

Pulse from 50 or 60 in mild, to 100 or even 120 in severe cases.

Temperature from 103° or 104° in mild, to 106°, 107°, or even 108° in severe cases. 108° was observed in one case only in the College practice, and ended in recovery. During convalescence the temperature rapidly falls, and in many cases to below the normal—to 99°—and rises to normal, about 101°. Gait awkward and slow—loss of tone in the muscles, particularly those of limbs, ears, and lips, and sometimes marked weakness in the hind quarters.

The respirations from 15 to 20 in mild, to 30 or 40 in graver cases. These, however, are subject to modifications, as in some horses treated at the College we observed the respiration even slower than natural at first, and increasing in frequency during convalescence. In some fatal cases the breath is foetid for some time before death, and respiration very rapid. Mucous membrane of the mouth of a venous red colour ; tongue dry ; faeces at first dry, but third or fourth day brown and poultice-like in consistence ; later on, diarrhoea in some cases.

Limbs slightly or considerably swollen ; urine diminished, sometimes albuminous and in some cases chocolate colour, and containing broken-down blood-corpuscles—*hæmoglobinuria*.

POST-MORTEM APPEARANCES.

Heart.—Congested; sometimes covered with mulberry-coloured spots—petechiæ. Clots of blood in auricles, ventricles, and larger blood-vessels.

Blood.—Dark-coloured and viscid; white corpuscles increased in number, and many of the red ones broken down.

Lungs.—Generally congested; infiltrated with fluid, or filled with blood extravasation, which has undergone decomposition prior to death, and gives rise to fœtor of the breath.

Liver and kidneys generally congested; kidneys sometimes black.

Connective tissue, particularly of the limbs, contains much fluid or semi-coagulated exudate.

Muscular system generally pale, flaccid, and sometimes dropsical, occasionally covered with dark spots.

The brain and its membranes congested, and the cranial cavities containing a superabundant quantity of fluid where signs of frenzy have been apparent before death.

Digestive System.—Mucous membrane of stomach sometimes congested, bowels inflamed, and occasionally covered with petechial spots. Contents generally fluid.

MORTALITY.

This seems to have varied during the last outbreak in a most remarkable manner. Some practitioners who have replied to a circular issued by me for the purpose of obtaining exact data for this paper, record a loss of only 1 to 2 per cent, whilst others return from 5 to 9; and it is reported that some have lost even a greater number. Our loss at the College was under 1; and at Piershill Barracks, out of a total of 59 treated by Mr Phillips upon the principles of this College, there were no deaths.

TREATMENT.

The first and most important essential in the treatment of the disease is absolute rest as soon as the slightest indication of illness has been observed.

The animal, if possible, should be placed in a cool, well-ventilated, but not cold, loose-box, warmly but not too heavily clothed with sheet and hood; and if a light-bred horse, and accustomed to bandages, should have the legs bandaged; but if a cart-horse, or one not used to bandages, they should not be applied, as they cause irritation and restlessness. The diet should consist of bran mash and a moderate quantity of hay for the first few days, except where a horse has been used to and is fond of a linseed mash; in such a case 1 lb. of well-boiled linseed should be mixed with the mash every night until the bowels are loosened, when, if there be any signs of diarrhœa, it

should be discontinued, and dry corn given. The mashes should be continued until the fever has subsided, and then gradually changed to the horse's ordinary diet. Cold water should be placed within the animal's reach, so that he can satisfy his—often inordinate—thirst, night and day. Medicinally but little is required. If there be marked constipation of the bowels, a small dose of pure cold-drawn linseed-oil, with spirits of nitre, might be given; but as a rule it is better to abstain from administering aperients.

In my 'Principles and Practice of Veterinary Medicine' I have written as follows: "By carefully watching this disease it will be observed that spontaneous diarrhœa sometimes occurs, which immediately relieves the symptoms. In some cases looseness of the bowels occurs on the second day, to the manifest relief of the animal. But all cases do not terminate thus; and in order to bring this favourable issue, nature has to be copied, and a mild cathartic, say 4 drachms of aloes, administered in the earliest stages." Since then the character of the disease has become intensified, and there is a greater tendency to super-purgation if an animal be physicked. Purgatives such as aloes should therefore not be administered.

The box or stable should not be too warm,—about 55° Fahr. is the proper temperature. Warmer than this the fever is prolonged. This fact has been brought before my notice by the following circumstance. At the New Veterinary College I have had three loose-boxes specially fitted up with hot-water pipes for the treatment of bronchitis and other affections of the air-passages, and found them of great utility; but the pink-eye cases put in these boxes did not recover as quickly as those kept in the cooler boxes—the warmer surroundings of the animals preventing the radiation of elevated animal heat.

In mild cases, in addition to what is already indicated, saline medicines are very useful; nitrate of potash, dissolved in the drinking-water, or, where there is a tendency to bowel irritation, hyposulphite of soda. If the bowel complications are attended with great pain, morphia and atropia subcutaneously injected were found to give great relief, and seldom required to be repeated. Where the pain in the limbs was very acute, the bromide of potassium in the drinking-water proved very useful. We had no occasion to check diarrhœa, as we looked upon it as one of the efforts of nature to expel the virus and its products from the economy—in fact, the "critical discharge" of the fever.

When the heart is very feeble, carbonate of ammonia in ball should be administered two or three times a-day. This increases the cardiac power without disturbing the tissue elements and nervous system, as is the case when alcoholic preparations are given. But all attempts to intensify the reactive processes of nature in getting rid of a virus are, to say the least, dangerous

where the disease is at all of an adynamic or low type, as the stimulant cannot supply the lost energy, while it retards the processes by which nature operates without it. For example, alcohol robs the red blood-globules of the oxygen which is so urgently called for—as evidenced by increased respiratory movements—by the tissues, in order to enable them to carry on that metabolism—tissue-change—by which the degraded elements are rendered soluble and in a condition fit to be excreted from the body. In addition to this, alcoholics tend to increase the coagulability of the blood by lowering its vitality, and causing the formation of those clots already referred to; but ammonia has a contrary effect on the blood, and tends to diminish coagulative properties and the formation of these fibrinous clots. At the same time it must be clearly understood, that except in cases where the heart's action is very feeble—and feebleness of the circulation, particularly when the blood is in the fibrinous condition, adds most materially to the formation of the clots—even ammonia should not be administered.

Again, where the prostration is great, the patients should be placed in “slings,” for if they lie down they are often unable to rise, particularly if they are heavy cart-horses. When the fever has subsided, as manifested by the return of the temperature to the normal condition, the falling of the pulse, disappearance of pain, &c., it may be necessary in some cases to administer stomachics, such as gentian, ginger, or other aromatic and bitter remedies, to promote the appetite and assist digestion. If, however, the appetite returns naturally, it is best not to interfere.

External Treatment.—If a particular joint or limb should be very painful, it may be fomented with hot water, and a soothing liniment—as aconite liniment—rubbed on the part; or if the breathing be painful, the chest should be enveloped in a rug or blanket, and warm water—warm and soothing, not hot and irritating—should be poured on to the blanket for an hour or so twice a-day, and the part afterwards dressed with oil or the above liniment, and covered with dry clothing. Beyond this, external applications are irritating and injurious, as the animal requires rest.

THE JERSEY CREAMER.

By ROBERT MENZIES, B.A., Haverland, Norwich.

IN general dairy management one of the first and most important operations is the separation of the cream from the other constituents of milk. Many systems have been devised to effect this process, from the simple method of pan and skimmer

to the highly complex separator. The subject of the following paper—the “Jersey Creamer”—is one of these systems which combines simplicity with science, and which, in the opinion of the writer, deserves to be better known.

The fundamental fact on which the action of the Jersey Creamer depends, is the difference in the specific gravities of the individual constituents of milk; the specific gravity of the fat (cream) being .985, while that of the “whole” milk is 1.030.

The chief distinguishing feature of the Jersey Creamer is that it directly increases this difference of specific gravities. It effects this by first raising the temperature of the milk to 110° Fahr., and then lowering the temperature rapidly to about 45° Fahr. Now, since water (of which milk contains about 87 per cent) is a better heat-conductor than fat, it cools more quickly, and therefore contracts before the fat is affected by the loss of heat. The specific gravity of the water consequently becomes relatively greater, and the lighter body, the fat, rises to the surface more rapidly, and what is of the greatest importance, more completely, than it otherwise would do.

Many experiments have shown that the separation is so thorough at the end of twelve hours that not more than .65 per cent of cream is left in the milk. So much for the theoretic principle of the system.

The apparatus itself consists of a set of three or more shallow pans which rest on a wooden frame and are hinged, so that they can be tilted. The pans are made of steel plates, and have an outer shell or jacket to contain water. These plates are tinned on the outside, and inside where the water is they are coated with a powerful anti-corrosion which entirely prevents rusting. A pipe is fixed in the bottom of each pan and passes through the jacket; a movable tin tube, having panels of fine wire-gauze, fits into the orifice of the pipe inside the pan, and can be closed by a gutta-percha plug attached to a tinned wire. The gauze, of which the panels are made, is open enough to pass the milk, but close enough to stop the cream-globules. A ventilated lid covers each pan. The pans contain from 2 to 12½ gallons. It is usual to make them in sets of three, each being of capacity sufficient to take the whole quantity from the morning or evening milking from a specified number of cows. Those in the dairy under the writer's care are of the following dimensions—viz., 30 inches long, 21 inches wide, 5 inches deep, and contain 10 gallons each. The only other thing which the system requires is a supply of hot and cold water to effect the necessary changes in the temperature of the milk. In dairies where these are both already laid on, the working of the creamer is very simple; but in cases where no such supplies exist, water must be heated, and can be supplied by hand, for a compara-

tively small quantity of hot water is required; but of cold water a great deal more is needed, and must be provided in a cistern elevated above the pans at least 12 inches.

In the dairy under the writer's charge, the hot water is applied by hand, and the cold from a cistern supplied by force-pump.

The cost of the apparatus here, exclusive of the force-pump, which was already fixed, was as follows, viz:—

Creamer, three pans	.	.	.	£9	0	6
Cistern, lead pipe, fixing, &c.	.	.	.	2	5	0
				£11 5 6		

The operation of the Jersey Creamer is very simple: The milk to be treated is put into the pan, and immediately afterwards hot water is poured into the jacket, in sufficient quantity to raise the temperature of the milk to 110° Fahr. The hot water is then drawn off, and cold water from the cistern is made to take its place; a small stream of cold water is then allowed to flow through the jacket until the end of the process. The cream begins to rise to the surface at once, and is completely separated at the end of twelve hours. The gutta-percha plug is now withdrawn, the milk flows off, and the cream is left on the bottom of the pan. The movable tube is then taken out, and the cream can be passed through the pipe with the help of a gutta-percha scraper, or the pan may be tilted, and the cream taken out at the end of the pan. The pan is then thoroughly cleaned for re-use.

The creamer has been worked in the dairy here for the last fourteen months, and during that time several experiments have been carefully carried out, and the following tables give some of the results obtained:—

TABLE I.

Breed of Cows.	System.	Weight of Milk.		Weight of Butter.		Weight of Milk required to produce 1 lb. of Butter.	
		lb.	oz.	lb.	oz.	lb.	oz.
Jersey . .	Shallow setting	100	0	3	13	26	0
Do. . . .	Creamer . .	100	0	4	14	20	7
Shorthorn .	Shallow setting	100	0	3	0	33	2
Do. . . .	Creamer . .	100	0	3	12	26	11

The milk was drawn from the same cows for the trial of each system. The cows were at grass; the Jerseys had a

daily allowance of $2\frac{1}{2}$ lb. decorticated cotton-cake, the short-horns $3\frac{1}{2}$ lb.

TABLE II.

Breed of Cows.	System.	Weight of Milk		Weight of Butter.		Weight of Milk required to produce 1 lb. of Butter.	
		lb.	oz.	lb.	oz.	lb.	oz.
Jersey . .	Shallow setting	100	0	3	3	31	4
Do. . . .	Creamer . .	100	0	4	10	21	8

The foregoing figures (Table I.) show that, when dealing with Jersey milk, the creamer yielded 28 per cent more butter than was obtained by skimming milk set in shallow pans, while in the case of shorthorn milk the increase of butter was 25 per cent.

Table II. gives the result of an experiment carried out during very thundery weather. In this case the actual quantity of butter gained by the use of the creamer was 1 lb. 7 oz., equal to 45 per cent.

Repeated trials fully confirm the above results, and I consider it a conclusion thoroughly established that the Jersey Creamer does very considerably increase the yield of butter; and it has the additional advantage that it does so without injuring the cream-globules, and so spoiling the "grain" of the butter. Further, the cream is obtained undiluted with skim-milk. In practice it is found that twelve hours is quite sufficient to effect complete separation. The skim-milk is then absolutely sweet, which is a consideration of great moment in these days, when the rearing of young stock is such an important branch of the dairy farmer's business.

The cost of working the Jersey Creamer is very small, not much greater than the ordinary setting system, for although more capital is required, and more water must be used—hot and cold—a great economy of labour is effected in the other processes; while in comparison with the centrifugal separator systems, it is altogether more economical, requiring less capital and labour, and no "power." The apparatus itself is strong and simple, occupies a small space in the dairy, has no parts likely to get out of order, is easily cleaned, and promises to be lasting.

¶ A creamer of the size (10-gallon pans) in use here is capable of separating the cream from 20 gallons of milk daily, equal to 7300 gallons per annum. Assuming that 3 gallons of milk are required to make a pound of butter by the shallow setting

system—the result obtained in the trial with the milk of shorthorn cows—7300 gallons of milk will yield 2433 lb. 5 oz. of butter. If the creamer increases this quantity even 20 per cent, we have a gain of 436 lb. 3 oz.; and this at 1s. 5d. per lb. (the average price obtained by the writer) amounts to £34, 9s. 2d.—a result of the highest significance for all interested in dairy-farming.

The advantages of the Jersey Creamer may be summarised thus:—

An increase of 25 to 28 per cent in the quantity of butter and cream produced.

An improvement in the quality of both cream and butter.

A supply of sweet skim-milk.

Economy of labour in the work of the dairy.

Simplicity of construction, facility in cleaning, and economy in maintenance.

In conclusion, I consider that the Jersey Creamer is a great improvement on all the old setting systems; that while its simplicity renders it manageable by the most unskilled, it produces results which are scarcely surpassed by the most expensive separators. It is, in my opinion, one of the very best systems yet introduced for either large or small dairies, and especially advantageous in those of the latter class, which are too small to employ the services of a skilled dairymaid.

MANURIAL EXPERIMENTS WITH TURNIPS.

By C. M. AIKMAN, M.A., B.Sc., F.R.S.E., Lecturer on Agricultural Chemistry, Glasgow and West of Scotland Technical College, and Glasgow University Extension Board.

THE experiments about to be described were carried out in 1889, and had for their object the testing of the value of basic slag as a turnip manure. In order to make the results as valuable as possible, the experiments were carried out on farms in different parts of the West of Scotland; and the author would take this opportunity of expressing his great indebtedness to those gentlemen who so kindly co-operated with him in carrying them out, and for the time and trouble they were good enough to place at his disposal. It is quite unnecessary to say a single word in explanation of what basic slag is. Most farmers have heard a good deal during the last year or two regarding it. The very successful results obtained by its use on the Continent—especially in Germany—have drawn the

attention of many of our farmers to its claims as a valuable source of phosphatic manure. But the British farmer is a cautious man, and the mere fact of a manure finding favour with the German farmer is, of itself, not sufficient guarantee to his mind to warrant him following suit. This caution is undoubtedly commendable. No farmer ought certainly to use a manure he is not convinced will repay him. He ought, however, to endeavour to ascertain the value of any great new source of manure as soon as possible. Unfortunately the opportunities and facilities he enjoys for testing the value of new manures are, in this country, not so numerous as are desirable, and the ultimate result of this extreme caution may be that a cheap and valuable manure may be allowed to be neglected, or it may be sent abroad for use there.

The rapidity with which basic slag found its way into the German agricultural markets was undoubtedly due to the fact that the German farmer, unlike the English farmer, enjoys exceptional advantages, in the facilities he possesses, for having any new manure tested. Germany, with its magnificently equipped experimental stations scattered throughout the length and breadth of the land, is not long in providing herself with the desired information.

When we consider that basic slag is chiefly produced in this country, that it is to be had in very large quantities and at a very moderate price,¹ it does seem highly desirable that in the interests of our agriculture very many more attempts should be made to ascertain whether it really is a cheap and valuable form of phosphatic manure for our British soils, and whether it is in our interests to allow it to be entirely exported to Germany instead of using it ourselves.

The slag used in these experiments was of quality, so far as I am aware, hitherto unexperimented with, except in North Wales, where it was used last year at my suggestion, in some experiments carried out by my friend Professor Dobbie of Bangor. It contained of phosphoric acid only 8.55 per cent (= tricalcic phosphate of lime, 18.66 per cent), and its mechanical fineness was such that 56 per cent passed through the regulation sieve. The price of this slag would be, I am informed by the makers, so cheap, that if it is shown to possess any fair manurial value, it would be for the farmer an extremely cheap source of phosphoric acid.

The experiments were intended to be carried out on the same scale in each of the series, but, owing to circumstances, a slight difference exists in certain cases. The aim of the experiments was to test the slag, first, alone in different quantities,

¹ We should be able to purchase it cheaper than the Germans do, who so largely export it from this country.

and against superphosphate; secondly, with farmyard manure as against "super" and farmyard manure; and thirdly, with farmyard manure and nitrate of soda, as against super and nitrate of soda with farmyard manure; and the whole of the unmanured plots were tested against plots which received no manure.

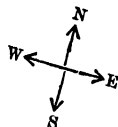
The superphosphate and nitrate of soda, used in all the experiments, were the same. The superphosphate contained 29.62 per cent "soluble" phosphate; while the nitrate of soda contained 95.95 per cent nitrate of soda.

The first series of experiments were those carried out on the farm of Mr John Gilchrist of Orbiston Mains, Bellshill, Lanarkshire, to whom any value the experiments possess is largely due.

The experiment plots were twenty in number, situated near the centre of a large field with a good exposure, and well removed from any hedge. The plots were arranged in two rows, ten plots in each row. Ten of the plots measured each the $\frac{1}{20}$ th of an acre, while the other ten were each $\frac{1}{40}$ th of an acre. The latter ten plots received no manure, and lay between the manured plots. The object of having so many was to minimise as much as possible errors due to the natural inequalities of the soil.

The following diagram will serve to show the arrangement of the plots:—

1	a	3	c	5	e	7	g	9	i
2	b	4	d	6	f	8	h	10	j



The breadth of each plot was six drills, equal to about five yards. The soil is described by Mr Gilchrist as "deep and alluvial on the south-east plots (viz., Nos. 1 and 2), somewhat stiffer on the middle plots, and on the north-west plots looser and more friable." The field, I should add, slopes to the south-east. The following is Mr Gilchrist's statement of the history of the field, during the previous five years, in respect to the manures applied and crops grown:—

Year.	Crop.	Nature.	Manure.
1883,	Potatoes, .	Of good quality, .	Farmyard manure.
1884,	Wheat, .	Heavy crop, .	Nothing.
1885,	Hay, .	Good crop, .	Nothing.
1886,	Hay, .	Heavy crop, .	Police manure.
1887,	Hay, .	Fair crop, .	{ 1 cwt. nitrate of soda and 1 cwt. salt per acre.
1888,	Oats, .	Extra heavy crop, .	
			Police manure.

The plots were manured as follows:—

Nos. *a, b, c, d, e, f, g, h, i, j*, received nothing.

No. 1 received *basic slag* at the rate of 14 cwt. per acre.

No. 2 received *superphosphate* at the rate of 9 cwt. per acre.

No. 3 received *basic slag* at the rate of 7 cwt. per acre.

No. 4 received *superphosphate* at the rate of $4\frac{1}{2}$ cwt. per acre.

No. 5 received *basic slag* at the rate of 14 cwt. per acre, and *farmyard manure* at the rate of 20 tons per acre.

No. 6 received *superphosphate* at the rate of 7 cwt. per acre, and *farmyard manure* at the rate of 20 tons per acre.

No. 7 received *superphosphate* at the rate of $4\frac{1}{2}$ cwt. per acre, *farmyard manure* at the rate of 20 tons per acre, and *nitrate of soda* at the rate of 1 cwt. per acre.

No. 8 received *basic slag* at the rate of 7 cwt. per acre, *farmyard manure* at the rate of 20 tons per acre, and *nitrate of soda* at the rate of 1 cwt. per acre.

No. 9 received *basic slag* at the rate of 14 cwt. per acre, *farmyard manure* at the rate of 20 tons per acre, and *nitrate of soda* at the rate of 1 cwt. per acre.

No. 10 received *farmyard manure* at the rate of 20 tons per acre.

The experiments were carried out with *Aberdeen yellow turnips*, which were sown on the 21st of May, during favourable weather, and which braided well. All the manures, with the exception of the nitrate of soda, were spread, or sown in the drills along with the seed. The farmyard manure was spread in the bottom of the drills, the slag and the superphosphate put on the top of it. The drills were then covered and sown the same evening. The nitrate of soda was applied as a top-dressing on the 12th of July (*i.e.*, some seven weeks after sowing). The weather after sowing was pretty dry. The crop was entirely free from turnip-fly.

When visited on the 26th of July the plots which had received dung showed best, but between the remaining plots there seemed to be very little apparent difference. The slag seemed to tell best on the *lightest* soil. Mr Gilchrist informed me that the plots which did not receive dung were some fourteen days later in being singled than the plots which did. The moisture carried into the drills along with the dung evidently helped the germination of the seed.

The turnips were lifted and weighed on the 18th of November. The following were the results. The weights do not include tops, which were not weighed.

I shall give the yield of the nothing plots first of all.

No.	Tons.	Cwt.	No.	Tons.	Cwt.
<i>a</i> . . .	18	17	<i>g</i> . . .	17	11
<i>b</i> . . .	14	0	<i>h</i> . . .	15	0
<i>c</i> . . .	14	11	<i>i</i> . . .	12	17
<i>d</i> . . .	9	8	<i>j</i> . . .	13	5
<i>e</i> . . .	14	2			
<i>f</i> . . .	14	2	Total	143	13

giving an average of 14 tons 7 cwt.

The discrepancy in the results of these nothing plots strikingly exemplifies the necessity of taking into account the inequalities in the soil, and the peculiar difficulties in the way of arriving at satisfactory results in this kind of experimentation

The results of the manured plots are as follows:—

No.	Manure.	Yield of Turnips		Increase over	
		per acre.		nothing plots.	
		Tons.	Cwt.	Tons.	Cwt.
1.	14 cwt. slag	21	10	+ 7	3
2.	9 cwt. super	18	5	+ 3	18
3.	7 cwt. slag	13	5	- 1	2
4.	4½ cwt. super	11	15	- 2	12
5.	14 cwt. slag, 20 tons dung	22	5	+ 7	18
6.	7 cwt. super, 20 tons dung	22	0	+ 7	13
7.	4½ cwt. super, 20 tons dung, 1 cwt. } nitrate of soda	24	10	+ 10	3
8.	7 cwt. slag, 20 tons dung, 1 cwt. } nitrate of soda	24	10	+ 10	3
9.	14 cwt. slag, 20 tons dung, 1 cwt. } nitrate of soda	25	10	+ 11	3
10.	20 tons dung	22	10	+ 8	3

The above results call for some remarks. In the first place it will be noticed that plots Nos. 3 and 4, respectively manured with 7 cwt. of slag, and 4½ cwt. of super, instead of showing an increase over the nothing plots, show a decrease of 1 ton 2 cwt. in the one case, and 2 tons 12 cwt. in the other. In noticing this, I was first inclined to think that the inequality in the yield of the nothing plots might explain it. I find, however, that on looking at the nothing plots adjoining these two plots, while in the case of No. 4 they do help to explain the anomaly, in the case of No. 3, they, on the other hand, increase it. With regard to the other plots it will be seen that No. 9 shows the largest increase—viz., 25 tons 10 cwt., or an increase over the average of the unmanured plots of 11 tons 3 cwt.—i.e., an increase of over 77 per cent. This plot, as will be seen from the table, was manured with 14 cwt. slag, 20 tons dung, and 1 cwt. of nitrate of soda per acre. The plots which show the next largest increase are Nos. 7 and 8—viz., 24 tons 10 cwt., or an increase over the average of the unmanured plots of 10 tons 3 cwt.—i.e., about 70 per cent of an increase. These plots received the same quantities of dung and nitrate of soda as No. 9, and 4½ cwt. of super, and 7 cwt. of slag respectively.

In summing up these results, and attempting to draw some practical conclusions from them, we may estimate the money value represented by the increase of crop obtained by the use of the manures; then calculate the money value of the manures applied, and by deducting the latter from the former ascertain what the profit amounts to. Secondly, we may estimate the unitary value these experiments show phosphoric acid to possess in the form of basic slag and superphosphate respectively. The following table shows side by side the cost of the manures and the value of the increase in crop. The slag is calculated at £1 per ton, the super at £2, 15s. 6d., the nitrate of soda at £10 per ton, and the dung at 6s. per ton:—

No.	Manure.	Cost.	Value of increase of crop.
1.	14 cwt. slag	£0 14 0	£5 0 0
2.	9 cwt. super	1 5 0	2 15 0
5.	14 cwt. slag and 20 tons dung . . .	6 14 0	5 11 0
6.	7 cwt. super and 20 tons dung . . .	6 19 0	5 6 0
7.	4½ cwt. super, 20 tons dung, and 1 cwt. nitrate of soda	7 2 0	7 2 0
8.	7 cwt. slag, 20 tons dung, and 1 cwt. nitrate of soda	6 17 0	7 2 0
9.	14 cwt. slag, 20 tons dung, and 1 cwt. nitrate of soda	7 4 0	7 16 0
10.	20 tons dung	6 0 0	5 14 0

N.B.—The turnips were sold for 14s. a ton.

From the above figures it will be seen that the only plots showing a clear profit are Nos. 1 and 2, which received slag and super alone. In the case of plots Nos. 8 and 9, which received dung and nitrate of soda in addition, there is, it is true, a slight profit; while in the case of No. 7 the cost of the manures and the value of the increase of crop balance each other. It will be seen in this case that the dung applied in such large quantities does not repay itself. Of course it must be borne in mind that the effect of the dung will not merely be felt during the first year, but also throughout most of the rotation. Still, while this is doubtless true of the dung, it may also be argued that it is likewise true to a certain extent of the slag.

On the whole, therefore, it would seem that the application of farmyard manure in such large quantities is not economical. Comparing plots Nos. 1 and 10, which received 14 cwt. slag and 20 tons dung respectively, we find that the increase in crop is practically the same, although the difference in the cost of the manures applied amounts to £5, 6s.

A comparison of plots Nos. 5, 6, and 10 shows that even an application of 20 tons farmyard manure alone constitutes in this case an excessive mineral manuring, since the addition of 14-cwt. slag and 7 cwt. super respectively produces no increase.

That, however, this does not apply to the same extent to nitrogen, plots Nos. 7 and 8 seem to indicate. In the case of these two plots, it will be seen that the addition of 1 cwt. of nitrate of soda increased the value of the yield nearly £2 per acre.

In conclusion, it must be admitted that the value of these experiments is considerably impaired by the fact that the rate at which the manures have been applied is excessive. As, however, many farmers apply manures very much on the same scale, these results cannot fail to possess considerable interest for many.

The next series of experiments were carried out on the farm of Mr George Graham, Easterboard, Croy, in the county of Dumbartonshire. The experiments were carried out on a clayey soil, and each plot was one-tenth of an acre in extent. The field possesses a fair southern exposure. The plots were each $2\frac{1}{4}$ yards broad, consisting of three drills. They ran from north to south—to within 6 yards of the top of the field, where there is a very ragged hedge, and to the foot of the field, where there is a ditch, separating it from the adjoining field.

The soil is described by Mr Graham as “rather clayey, with a white moorish sand in it; altogether a poor soil, and has always required very liberal treatment to raise good crops.” A carefully selected sample of the soil was analysed before the commencement of the experiments, and the following are the results:—

(a) Mechanical analysis—

Clay	.	.	.	.	79.91 per cent.
Sand	.	.	.	.	20.09 "
					100.00 "

(b) Chemical analysis (soil dried at 212° Fahr.)—

Organic matter ¹	.	.	.	.	10.633
Iron sesquioxide and alumina	.	.	.	.	9.000
Lime	.	.	.	.	.504
Magnesia	.	.	.	.	.366
Potash	.	.	.	.	.141
Soda	.	.	.	.	.307
Sulphuric acid	.	.	.	.	.078
Phosphoric acid	.	.	.	.	.185
Insoluble siliceous matter, chlorine, carbonic acid, &c.	.	.	.	.	78.786
					100.000

¹ Containing nitrogen .232.

The past history of the field is described by Mr Graham as follows: “It was green-cropped in 1880 with turnips, and got liberal manuring (25 to 30 tons), with city of Glasgow police manure. The crop of turnips was very poor; but the succeeding oat crop was fair, and the hay crop in 1882 was also a fair crop. In the summer of 1883 it was eaten by cattle till the middle of

June, and then left to grow hay, which was mown about the end of July. It has been in grass ever since, till last year, when there was a crop of oats on it, which was poor, with the exception of a small piece at the top of the field, which was good." I forgot to add that, with regard to the situation of the field, the north side is a very little higher than the south, and that a slight elevation takes place two-thirds of the way down the field, so that one part lies to the south and another part to the north. As, however, each plot extends the whole length of the field, this inequality is shared equally by every plot.

The field was deeply ploughed with Oliver's chilled plough about the end of November. It was wrought into a fine tilth just before drilling. The drills were opened on the 27th of May, the farmyard manure spread in, and the slag, superphosphate, and the nitrate of soda were sown with the hand the same day. The drills were then closed, and the turnips were sown the following morning before seven o'clock, rain beginning to fall before the sowing was finished. The ground was in good order, and other circumstances were favourable—rain and heat continuing for several days. The kind of turnip used in this experiment was Drummond's Improved Aberdeen Green Top Yellow. The following is a statement of the quantities of manures applied per acre:—

Plot No.

1. Nothing.
2. 4 cwt. super.
3. 8 cwt. super.
4. 6 cwt. slag.
5. 12 cwt. slag.
6. Nothing.
7. 6 cwt. slag, 15 tons dung, and 1 cwt. nitrate of soda.
8. 6 cwt. slag and 15 tons dung.
9. 12 cwt. slag and 15 tons dung.
10. 12 cwt. slag, 15 tons dung, and 1 cwt. nitrate of soda.
11. Nothing.

The following are the notes supplied me by Mr Graham: "June the 5th. The turnips braided; the ground at that time being very much battered with rain, and caked on the top. At the end of June the turnips were thinned—all, at any rate, with the exception of No. 1 (nothing plot), which was not ready for thinning till the 11th of July. On that date the plots showed as follows:—

"Nos. 7 and 10—those which received slag along with dung and nitrate of soda—looked best.

"Plots Nos. 8 and 9—those which had received, along with the slag, dung—were next best in appearance, and only slightly inferior to Nos. 8 and 10.

"Plots Nos. 2 and 3—those which had received superphosphate in larger and smaller quantity respectively—came next in

order, looking considerably poorer, but differing very little from one another.

"Plots Nos. 4 and 5—those which had received slag in larger and smaller quantity respectively—came next in appearance, and did not seem to differ in appearance from one another.

"Plots Nos. 6 and 11—those which received nothing—came last." With regard to these two plots, Mr Graham remarks that they each received a small portion of the slag which was blown over, when being sown, in the adjoining plots, and that they can scarcely be regarded as "fair" nothing plots.

The turnips were lifted in the beginning of December, and weighed as follows:—

No.	Manure.	Produce.			Increase over nothing plots.		
		tons	cwt.	qrs.	tons	cwt.	qrs.
1. Nothing		3	8	3	...		
2. 4 cwt. super		19	0	0	10	17	3
3. 8 cwt. super		19	15	0	11	12	3
4. 6 cwt. slag		17	1	1	8	19	0
5. 12 cwt. slag		17	16	1	9	14	0
6. Nothing		12	15	3	...		
7. 6 cwt. slag, 15 tons dung, and 1 cwt } nitrate of soda		28	0	0	19	17	3
8. 6 cwt. slag and 15 tons dung . .		24	12	2	16	10	1
9. 12 cwt. slag and 15 tons dung . .		25	18	3	17	16	2
10. 12 cwt. slag, 15 tons dung, and 1 } cwt. nitrate of soda		28	2	2	20	0	1

No. 11 was not weighed, as Mr Graham considered it valueless as a nothing plot, as it received slag blown over from No. 10.

In calculating the nothing plots I have taken the mean of plots Nos. 1 and 6. Plot 6 received a little slag from No. 5; and that, Mr Graham thinks, will account for the difference. With regard to No. 1, I wrote Mr Graham on receiving his results, asking him if he was quite convinced of their accuracy, and received the following reply: "The statement I have given in regard to No. 1 (nothing plot) is thoroughly correct. There was no circumstance connected with it in any way calculated in the least to give it an unfair chance. Every plant lived on till the time for storing; but they were useless dwarfs."

It will be seen from the above results that the plots which show the biggest returns are Nos. 7 and 10—those which received slag, dung, and nitrate of soda. There is very little difference between the two. Nos. 8 and 9 come next—those which received slag and dung; No. 9, which received the larger quantity of slag, giving about $1\frac{1}{2}$ ton more turnips than No. 8. Between plots Nos. 2 and 3—viz., those which received "super" alone in greater and smaller quantity respectively—there is not much difference, only some 15 cwt., not sufficient to justify the additional expense of the larger quantity of super.

The plots which show the lowest returns are those which received slag alone. Whether, however, this shows slag to be inferior in worth as a manure in this case to super, cannot be inferred until we compare the cost of the manures. This, accordingly, will be seen from the following table:—

Plot No.	Manure.	Cost.	Value of increase in crop.
2.	4 cwt. super	£0 11 0	£4 6 0
3.	8 cwt. super	1 2 0	4 13 0
4.	6 cwt. slag	0 6 0	3 11 6
5.	12 cwt. slag	0 12 0	3 17 6
7.	6 cwt. slag, 15 tons dung, and 1 cwt. nitrate of soda	5 6 0	7 19 0
8.	6 cwt. slag and 15 tons dung	4 16 0	6 12 0
9.	12 cwt. slag and 15 tons dung	5 2 0	7 2 8
10.	12 cwt. slag, 15 tons dung, and 1 cwt. nitrate of soda	5 12 0	8 0 0

(N.B.—The turnips were sold at 8s. per ton.)

An examination of the above table will show that in every case there is a fair margin of profit; the most profitable being Nos. 2, 3, 4, and 5, those which received mineral manure alone. Of these, No. 2 shows best—that which received 4 cwt. super per acre—a profit of £3, 15s. No. 3 comes next, showing a profit of £3, 11s.; while Nos. 4 and 5 are exactly the same. In this case, then, it may be said that the slag is weight for weight one half as valuable as the super. As, however, the slag contains only a little more than half the percentage of phosphates, the unitary value of the phosphates in each is practically the same.

In these experiments, as in the previous series, the dung does not justify its application. By comparing the results of plots Nos. 4 and 8 it will be seen that the addition of 15 tons of farmyard manure, costing £4, 10s., only gave an increase of 7½ tons, possessing the value of £3, while comparison between Nos. 5 and 10 will show a similar result.

Comparing plots Nos. 7 and 8, and 9 and 10, it will be found that, in the first case, 1 cwt. of nitrate of soda, costing 10s., was the means of increasing the crop to the extent of over 3 tons, value £1, 7s.; while in the second, the increase amounted to only about 2 tons, value 17s.—sufficient, however, to show a profit.

The next series of experiments about to be described were those carried out by Mr A. Stevenson, at his farm of Parkhill, Tarbolton, Ayrshire. The soil of the field experimented upon was a sandy loam, naturally not fertile, but which had been liberally treated for many years, and yielded fair crops. The mechanical and chemical analysis of the soil is as follows:—

(a) Mechanical analysis—

Clay	52.41
Sand	47.59
	100.00

(b) Chemical analysis (soil dried at 212° Fahr.)—

Organic matter ¹	7.770
Iron sesquioxide and alumina	3.900
Lime	.616
Magnesia	.200
Potash	.173
Soda	.154
Sulphuric acid	.073
Phosphoric acid	.207
Insoluble siliceous matter, chlorine, carbonic acid, &c.	86.907
	100.000

¹ Containing nitrogen .207.

Mr Stevenson describes its past history as follows: "In 1883 the field was ploughed out of lea, and a crop of oats taken. The oats received 1½ cwt. super, 1 cwt. dissolved bones, and 1 cwt. nitrate of soda per acre. In 1884 there was a crop of potatoes, which were manured with 18 tons farmyard manure, 2 cwt. super, 2 cwt. dissolved bones, and 1 cwt. sulphate of ammonia per acre. In 1886 there was a crop of hay, which was manured with 1 cwt. super, 1 cwt. dissolved bones, and ½ cwt. sulphate of ammonia per acre. In 1887 a crop of hay was grown which received the same quantity of manure as was applied the previous year; and in 1888 a crop of oats was grown which received the same manures as those applied in 1883."

The ground is low-lying, and has a southern as well as a northern exposure. The plots were ten in number, each being 1-10th of an acre in extent.

The following is a statement of the different plots, with the quantities of manures each received, and the produce yielded:—

No.	Manure.	Produce.		Increase over nothing plots.	
		tons	cwt.	tons	cwt.
1.	Nothing	16	12	...	...
2.	6 cwt. slag	19	0	2	8
3.	4 cwt. super	20	17	4	5
4.	12 cwt. slag	23	12	7	0
5.	8 cwt. super	23	0	6	8
6.	12 cwt. slag and 20 tons dung	28	7	11	15
7.	12 cwt. slag, 20 tons dung, and 1 cwt. nitrate of soda	31	0	14	8
8.	6 cwt. slag and 20 tons dung	26	15	9	3
9.	6 cwt. slag, 20 tons dung, and 1 cwt. nitrate of soda	30	10	13	18
10.	5 cwt. super and 20 tons dung	33	0	16	8

The largest returns are obtained from plot No. 10—that receiving 5 cwt. super and 20 tons dung—viz., 33 tons per

acre, or 16 tons 8 cwt. of an increase over the average of the nothing plots.

The following table shows the value of the manures and the value of the increase of crop produced by them:—

No.	Manure.	Cost.	Value of increase in crop.
2.	6 cwt. slag	£0 6 0	£1 9 0
3.	4 cwt. super	0 11 0	2 11 0
4.	12 cwt. slag	0 12 0	4 4 0
5.	8 cwt. super	1 2 0	3 17 0
6.	12 cwt. slag and 20 tons dung	6 12 0	7 1 0
7.	12 cwt. slag, 20 tons dung, and 1 cwt. nitrate of soda }	7 2 0	8 13 0
8.	6 cwt. slag and 20 tons dung	6 6 0	5 10 0
9.	6 cwt. slag, 20 tons dung, and 1 cwt. nitrate of soda }	6 16 0	8 1 0
10.	5 cwt. super and 20 tons dung	6 13 9	9 17 0

The most profitable plot, it will be seen, is No. 4, which received slag alone at the rate of 12 cwt. per acre. Again it will be seen that, with the exception of plot No. 10, farmyard manure applied did not give its value in increase of crop.

A comparison of plots Nos. 2 and 3, and Nos. 4 and 5, will show that in the first case super shows better than the slag, while in the second case slag shows better than the super. Again, in both cases where the nitrate of soda has been used it shows a very marked increase. Thus in plot No. 7, 1 cwt. of nitrate of soda (costing 10s.) has given an increase of crop over plot No. 6 of the value of £1, 12s., while in plot No. 9 the increase over plot No. 8 is £2, 11s.

The last series of experiments were those carried out by Mr James Fulton on his farm at Balshagray, Whiteinch, near Glasgow.

The experimental plots were situated in the centre of a large field with a fair southern exposure, and on perfectly level ground. The soil is described by Mr Fulton as “a good loam with a touch of clay in it.”

The past history of the field since 1885 is as follows:—

1885. Turnips, which received 40 tons farmyard manure to the acre.

1886. Wheat, which received no manure.

1887. Hay, which received nitrate of soda.

1888. Potatoes, which received 15 tons farmyard manure and 3 cwt. special artificial potato-manure.

The plots were eleven in number, and consisted each of 1-20th of an acre in extent; each plot being 3 yards wide—containing 4 drills—and running from north to south.

The manures used in these experiments consisted of slag, superphosphate, and farmyard manure. Owing to a mistake,

nitrate of soda was forgotten to be applied. The variety of turnip used in this case was the Purple Top Swede. The manures and the turnips were sown on the 22d of May. There was no rain for five days after sowing. They were thinned on the 21st of June, and lifted on the 19th of November.

The following table exhibits the quantities of manures and returns of turnips yielded by the different plots:—

No.	Manure.	Produce.		Increase over nothing plots.	
		tons	cwt.	tons	cwt.
1. Nothing		16	...	...	...
2. 6 cwt. slag		17	5	1	5
3. 2½ cwt. super		16	10	...	10
4. 12 cwt. slag		18	...	2	...
5. 5 cwt. super		17	15	1	15
6. 4 cwt. slag and 10 tons dung		20	10	4	10
7. 4 cwt. slag and 10 tons dung		20	10	4	10
8. 6 cwt. slag and 10 tons dung		20	...	4	...
9. 6 cwt. slag and 10 tons dung		20	10	4	10

The largest increase will be seen in plot No. 9, receiving 6 cwt. slag; but between this plot and plots Nos. 6 and 7—receiving 4 cwt. of slag and 10 tons dung—there is practically very little difference.

The largest increase is in plots Nos. 5 to 9, receiving different quantities of slag along with 10 tons of dung, the plots receiving the smaller quantity of slag showing an equal increase to those receiving the larger quantity of slag. With regard to the plots receiving slag and super alone, it will be seen that in both cases the slag gives distinctly better results than the super. The following table exhibits the cost of the manures and the value of the increase. The turnips were sold at 16s. per ton:—

No.	Manure.	Cost.	Value of increase in crop.	
			£0	19 6
2. 6 cwt. slag		£0 6 0	£0	19 6
3. 2½ cwt. super		0 6 10	0	8 0
4. 12 cwt. slag		0 12 0	1	12 0
5. 5 cwt. super		0 13 8	1	8 0
6. 4 cwt. slag and 10 tons dung		3 4 0	3	12 0
7. 4 cwt. slag and 10 tons dung		3 4 0	3	12 0
8. 6 cwt. slag and 10 tons dung		3 6 0	3	4 0
9. 6 cwt. slag and 10 tons dung		3 6 0	3	12 0

These figures show again that the most profitable manure is the slag; and that the farmyard manure, even applied at the rate of 10 tons an acre, did not pay.

N.B.—The following table contains the results of all the experiments in a convenient form:—

Slag	0	6	11	7	(gain)	5	6	...	...
Dung	20	12	15	1	0 9	12	0	...	...
Slag	0	5	17	7	2	3	5	...	...
Dung	15	0	16	2	8	2	4	...	...
Slag	0	6	7	5	(loss)	0	6	...	...
Dung	20	14	18	11	1 3	11	0	...	...
Super	0	6	16	9	(gain)	8	6	...	...
Dung	20	5	8	17	3 3	9	0	...	...
Super	0	6	7	5	(loss)	3	6	...	...
Dung	20	7	13	6	1 13	3	0	...	...
Slag	0	6	10	7	(gain)	...	...	...	...
Dung	20	7	3	2	0 5	...	0	...	...
Nitrate	0	6	10	7	...	...	...	...	...
Slag	0	7	11	7	0 12	...	...	...	...
Dung	20	14	3	16	0	...	6	...	...
Nitrate	0	7	19	7	2 13	...	4	...	...
Slag	0	5	19	7	0	...	...	...	...
Dung	15	6	17	19	0	...	...	...	...
Nitrate	0	5	20	8	2 8	...	...	...	...
Slag	0	5	13	8	0	...	...	...	...
Dung	15	12	18	1	0	...	...	...	...
Nitrate	0	6	16	8	1 5	...	...	...	...
Slag	0	6	14	8	0	...	...	...	...
Dung	20	1	8	13	1 11	...	6	...	...
Nitrate	0	7	2	8	...	...	...	...	...
Slag	0	7	14	8	...	...	...	...	...
Dung	20	2	8	13	...	...	...	...	...
Nitrate	0	1	1	1	...	...	...	...	...

The following conclusions may be drawn from the results of these experiments:—

1. That while farmyard manure is valuable in giving the crop a good start and bringing it well forward during the period of germination and early growth by supplying a certain amount of easily assimilable plant-food, and, in the case of dry weather, attracting a quantity of moisture, it is not profitable—as far as first year's results are concerned—when applied in such quantities as 20 or even 10 tons per acre.

2. That the basic slag proved by far the most economical of the manures used; and that, further, the larger quantities of slag proved more profitable than the smaller.

3. That superphosphate of lime was also a profitable manure, and that, as in the case of the slag, the larger quantities gave better results than the smaller.

4. That nitrate of soda in every case showed itself to be a most profitable manure.

THE CEREAL AND OTHER CROPS OF SCOTLAND FOR 1890, AND METEOROLOGY OF THE YEAR RELATIVE THERETO.

THE CROPS.

THE following comparison of the cereal and other crops of 1890 with the previous year, has been prepared by the Secretary of the Society from answers to queries sent to eminent agriculturists in different parts of the country.

The meteorology of the year has been furnished by Dr Alexander Buchan, Secretary of the Meteorological Society of Scotland.

The queries issued by the Secretary were in the following terms:—

1. What was the quantity, per imperial acre, and quality of grain and straw, as compared with last year, of the following crops? The quantity of each crop to be stated in bushels. What quantity of seed is generally sown per acre?—(1) Wheat, (2) Barley, (3) Oats.
2. Did the harvest begin at the usual time, or did it begin before or after the usual time? and if so, how long?
3. What was the quantity, per imperial acre, and quality of the hay crop, as compared with last year, both as re-

gards rye-grass and clover respectively? The quantity to be stated in tons and cwts.

4. Was the meadow-hay crop more or less productive than last year?
5. What was the yield of the potato crop, per imperial acre, as compared with last year? The quantity to be stated in tons and cwts. Was there any disease? and if so, to what extent, and when did it commence? Were any new varieties planted, and with what result?
6. What was the weight of the turnip crop, per imperial acre, and the quality as compared with last year? The weight of the turnip crop to be stated in tons and cwts. How did the crop braird? Was more than one sowing required? and why?
7. Were the crops injured by insects? State the kinds of insects. Was the damage greater or less than usual?
8. Were the crops injured by weeds? State the kinds of weeds. Was the damage greater or less than usual?
9. Were the pastures during the season of average growth and quality with last year?
10. How did stock thrive on them?
11. Have cattle and sheep been free from disease?
12. What was the quality of the clip of wool, and was it over or under the average?

From the answers received, the following statistics have been compiled:—

MID-LOTHIAN.—Wheat, the yield about 40 bushels; straw not so heavy as last year; quality of both grain and straw much the same as last year; 3 bushels of wheat sown. Barley, yield about 44 bushels; straw considerably less than last year; quality of both grain and straw better than last year; 3 bushels of barley sown. Oats, yield of potato-oats about 64 bushels; straw a very heavy crop, and finer quality than last year, not being so much laid; indeed oats were the crop of the season; 4 bushels of oats sown. Commenced harvest 1st September, being a week later than last year; very favourable weather; finished within the month. Hay, excellent crop; average 3 tons weighed in of tramp rick before harvest; quality very fine; much the same as last year. Potatoes, the yield little more than the half; Regents about 5 tons sound potatoes; Bruce and Magnums about 7 tons sound potatoes; about a fourth part of the Regents diseased. Turnips, yellows about 25 tons; swedes 20 tons; quality much the same as last year; crop much less; fine braird; only once sown; finished thinning in the month of June. No damage by insects. No weeds. Pastures much the same growth, but very little feeding quality owing to wet season. Cattle throve well; sheep very bad. Cattle and sheep quite free from disease. Clip of wool about the average of former years.

WEST LOTHIAN.—Wheat, about the same in quantity and quality as compared with last year; from 30 to 40 bushels; seed from $2\frac{1}{2}$ to 3 bushels. Barley, about the same quantity and quality of straw; grain hardly so good in quantity and quality as compared with last year; 28 to 38 bushels,

seed from $2\frac{1}{2}$ to 3 bushels. Oats, about the same quantity and quality of both grain and straw as compared with last year; from 30 to 40 bushels; seed from 4 to 6 bushels. Harvest began and ended about the same time in the lower district, but in the higher district it would be fully a fortnight later than last year. Hay, about the same in quantity and quality as compared with last year; from $1\frac{1}{2}$ to $2\frac{1}{2}$ tons. Meadow-hay good, but very little grown in the district. Potatoes, much less in quantity and not nearly so good in quality as last year; from 3 to 7 tons; much disease. Turnips, about the same in quantity and quality as last year; no second sowing; from 15 to 25 tons. No damage by insects. Crops not injured by weeds. Pastures not so good as last year. Stock did not thrive well, but were free from disease. An average clip of wool.

HADDINGTONSHIRE (Upper District).—Wheat, scarcely any grown. Barley, 26 to 40 bushels; good quality, but somewhat highly coloured; straw average crop; seed 3 to $3\frac{1}{2}$ bushels. Oats, 36 to 40 bushels; very good quality; straw above average; seed, 4 bushels. Harvest commenced 10th September, a week later than last year. Hay, 2 tons of good quality; crop less than average. Meadow-hay, larger crop than last year, but damaged by rain in manufacture. Potatoes, 4 to 5 tons; crop less than average; Regents three-quarters diseased; commenced in beginning of August; Magnums free of disease; no new varieties. Turnips, 14 to 20 tons; good quality; braided well; and only once sown. Wild mustard very prevalent in some fields. The pastures of average growth, but not of so good feeding quality as usual. Stock did not feed well. Clip of wool, a fair average of good quality.

HADDINGTONSHIRE (Lower District).—Wheat, 36 bushels; not quite so much straw as last year, but both grain and straw better quality; $3\frac{1}{2}$ bushels sown. Barley, fine crop; 44 bushels; weight, 56 to 57 lb.; better quality than last year; average straw; $2\frac{1}{2}$ bushels seed sown. Oats, 46 bushels; weight, 43 to 44 lb.; good quality; straw about the same as last year; 4 bushels seed sown. Harvest began 16th August, about the same time as last year; weather at first rather showery, but made a good finish. Hay crop about the same as last year; fair mixture of rye-grass and clover; showery weather for haymaking, consequently quality not quite so good as last year. Meadow-hay, none. Potatoes, a poor crop; 5 tons, and much diseased, especially the earlier kinds. Turnips not such a big crop as last year; 20 tons; good quality; one sowing; braided well. No injury by insects or weeds. Pastures as good as last year, both as regards quantity and quality. Stock thrived fairly well, but hardly so well as last year. Cattle and sheep free from disease. Full average clip; good quality; price very low; about the same as last year.

BERWICKSHIRE.—Wheat, 33 bushels; quality of grain and straw not so good as last year; 3 bushels seed. Barley, 37 bushels; quality of grain and straw average; 3 bushels seed. Oats, 39 bushels; quality of grain and straw above average; $4\frac{1}{2}$ bushels seed. Harvest, after the usual time, ten days late. Hay, 1 ton 5 cwt.; quality good. Meadow-hay, very little grown; quality good. Potatoes, $\frac{1}{3}$ less than last year; 5 tons; there was not much disease in the field; the early potatoes in the cottagers' gardens all hurt with disease. Turnips, not such a large crop as last year; 18 tons; braided well; no resowing. No injury by insects or weeds. Pastures, average growth; but not such good quality. Stock, thrived not so well as last year, but were free from disease. Clip of wool, good quality; average weight.

ROXBURGHSHIRE.—Wheat, about 27 bushels; quality not so equally

good as the former crop; straw fully average bulk. Barley, about 33 bushels; great bulk of straw; quality of the grain irregular; early districts good, and in the later dark-coloured. Oats, a very bulky crop of straw, and fully an average crop of grain; about 38 bushels, and fine quality. Harvest, a few days later than an average season. Hay, about $1\frac{1}{2}$ ton; not very well got; a great want of clover. Meadow-hay, a large crop, but a large proportion destroyed in the making with wet weather. Potatoes, not more than 4 tons of marketable potatoes, and the early sorts a good deal diseased, many of them not yielding 2 tons of good ones. Turnips, a good crop, but not so large as last year; from 18 to 20 tons; braided well; no second sowing. No injury by insects. Very few weeds. Pastures, fully average. Sheep did well first of the season, but not so after June. Cattle and sheep very healthy. Clip of wool, about average, and good quality.

SELKIRKSHIRE.—Wheat, none grown. Barley, 42 bushels; straw and grain both of good quality; 3 bushels sown. Oats, 36 to 40 bushels; a large crop, and very well got; grain and straw of good quality; 4 to 6 bushels sown. Harvest began from three to four weeks after the usual time. Hay, quantity $1\frac{1}{2}$ to 2 tons; rather under an average in quality, with very little clover. Meadow-hay, large crop, and, as a rule, badly got. Potatoes, a small crop and badly diseased; from 3 to 4 tons; no new varieties grown. Turnips, 14 to 18 tons; almost an average crop, and of good quality; crop braided well, and no second sowing. No damage done by insects. Owing to the wet season weeds were abundant, but no extra damage done. Pastures, there was a large growth, but quality deficient owing to abundance of moisture. Stock thrived well; but, like last season, they did not fatten so well as usual. Cattle and sheep have been free of disease. Wool, an average clip, and of good quality.

PEEBLESSHIRE.—No wheat. Barley, not a good crop; about 30 bushels; quality and quantity of grain and straw considerably less than last year. Oats, a lighter crop than in the previous year; averaging about 34 bushels; straw less bulk also. Harvest began rather after the usual time. Hay crop was lighter than last year; about 2 tons; generally well secured. Meadow-hay was about an average crop, but a quantity of it was put together in bad order, owing to the showery season. The potato crop was one of the poorest for many years; the yield would not exceed 4 tons, about one half of which was diseased. Turnips, not so good a crop as last year; about 15 tons at most; the crop braided well, but the constant rain day after day, and the want of sun during the greater part of summer, were much against their development. No damage by insects. Weeds were difficult to keep down owing to the rain. The pastures were not so good as last year. Stock did not thrive so well on them. There has been no disease among sheep or cattle. The clip of wool was rather over an average, and of good quality.

DUMFRIESHIRE (Upper Nithsdale).—Wheat, none grown. Barley, none grown. Oats, from 28 to 30 bushels, and deficient in quality; straw up to last year in quantity, but very poor in quality, and badly harvested; seed sown, from 5 to 6 bushels. Harvest fourteen days after usual time. Hay, quantity about 1 ton 1 qr., and not so well secured as previous year owing to unfavourable weather; little clover. Meadow-hay, yield about $\frac{1}{2}$ less than previous year, and generally better quality. Potato crop, the worst for many years, and not above $\frac{1}{3}$ of previous year; disease showed early, and growth checked. Turnips, from 10 to 15 tons according to situation, and a poor crop on cold undrained land; quality deficient from previous year; braided good, and no resowing; want of sun after singling

spoiled the crop. Little damage from insects. The potato and turnip crops much injured by annual weeds, continued wet weather preventing horse-hoeing. Pastures, fair growth, but poor quality. Stock made little progress. Cattle and sheep free from disease, with exception of foot-rot, very prevalent among sheep stock. Average clip of wool, and fair quality.

KIRKCUDBRIGHTSHIRE.—Wheat, 28 bushels; quality indifferent; seed, 2½ to 3 bushels. Barley, 30 bushels; quality indifferent; straw heavy; seed, 3 to 4 bushels. Oats, 40 bushels; quality various, owing to harvest; grain generally fairly good; straw strong, and in some cases inferior; very bulky crop of straw, nearly double last year; seed, 4 to 5 bushels. Harvest nearly two weeks later. Hay, 1½ to 2 tons; quality moderately good. Meadow-hay, more productive, but badly saved. Potatoes, yield about 5 tons, not much over half of last year; some disease in early varieties; Magnums pretty sound. Turnips, 14 to 16 tons; much under last year; quality not so good; too much rain; good braird; no resowing. Weeds, green crop more than usual, owing to difficulty of cleaning in bad weather. Pastures, abundant growth, but poor quality. Stock throve badly. Cattle fairly free from disease. Sheep suffered much from foot-rot. Clip of wool, average quality and quantity.

WIGTOWNSHIRE.—Wheat, 28 bushels; quality inferior; straw, 1½ ton, good; seed used, 3 bushels. Barley, 40 bushels; quality inferior to last year; straw, 1 ton; seed used, 4 bushels. Oats, 44 bushels, average quality; straw, 1½ ton, good; seed used, 5 bushels. Harvest fourteen days later than usual. Hay, 1 ton 8 cwt.; quality a fair average. Meadow-hay, somewhat less productive than last year. Potatoes, 4½ tons; considerable disease, which commenced early; new variety, Bruces, a good crop and sound; Sutton's Abundance, a fair crop, but diseased. Turnips, 17 tons; quality not so good as last year; brairded well; only one sowing required, but growth retarded by cold; damp season. No injury by insects or weeds. Pastures of average growth, but much inferior in quality. Stock throve not well; did not fatten as usual. Cattle and sheep free from disease. Clip of wool, quality good, but weight somewhat lighter than usual.

AYRSHIRE.—Wheat—with a very great bulk of straw, the produce was inferior, both in quantity and quality; the weight of straw may be put at 2 tons, and the yield of wheat at 30 to 32 bushels; the rainy and cloudy months of July and August prevented the early promise of the summer from being realised; quantity of seed, 3 bushels in the lower districts, up to 4 bushels on higher land. Barley gave a big crop of straw, but a poor return of grain; on the light soils of Carrick the bulk was much greater than the crop of 1889, and there was a good yield on some Ayrshire farms; but the average probably was not above 36 bushels, and the grain was inferior in quality; amount of seed, 4 to 5 bushels. On light lands oats gave the bulkiest crop of recent years, but the yield of grain in thrashing was moderate, say 44 to 50 bushels of rather inferior grain, and less in upland districts; the straw might amount to 2 tons. The harvest was more than two weeks later than in average seasons. Rye-grass hay was a well-grown crop, but the rainy weather made the quality inferior; the average yield might be about 35 cwt. Meadow-hay was a good crop, but it was very late of being harvested in the uplands. There was a fine crop of potatoes; the early crop was very remunerative; about the beginning of July they would average 5 to 6 tons; but disease appeared before the middle of July, and the second earlies, the Champions, and the late varieties were destroyed to the extent of more than ½. The turnip crop was far under an average; on heavy soils it was very poor, and over

the county it was not equal to more than $\frac{1}{2}$ of the yield of the previous year. Little complaint of insects. The turnip crop was difficult to keep clean on account of the excess of moisture; with little sunshine there was not sufficient evaporation to dry the land, and weeds grew rapidly in well-manured soils. There was abundance of grass, though it might not be so nutritious as in sunnier seasons. Stock did well, and nothing unusual of disease. A good clip, and fully an average in quality.

BUTE.—Wheat, none grown. Barley, under average crop; about 32 bushels; badly got; seed sown, 4 bushels. Oats, under average crop; about 30 bushels; seed sown, 5 to 6 bushels. Harvest later than usual; began about 1st September. Hay, an average crop both as regards rye-grass and clover; about 2 tons; Timothy about $2\frac{1}{2}$ tons; quality inferior. Meadow-hay, an average crop, but badly got; little meadow-hay in this island. Potatoes, worst crop for many years; about 4 tons; a good deal of disease, which commenced in July; no new varieties. Turnips, very inferior crop; from 10 to 18 tons; crop braided well; no resowing. No injury by insects. The usual soft weeds due to the wet season. Pastures, average. Stock thrived well, and were free from disease. Clip of wool, about an average. The inferiority of the grain crops was due to the excessive rain, and owing to the same cause the harvest was the most protracted one experienced for many years.

ARRAN.—Wheat, none. Barley, none. Oats, about 36 bushels; more straw than last year; oats scarcely as heavy per bushel; 6 bushels sown. Harvest, about a week later; commenced 27th August. Hay crop generally good; about 2 tons. Meadow-hay, none. Potatoes, deficient about one-half; about 3 tons; a good deal of disease in earlier kinds commenced in July; no new variety. Turnip crop, not so good; about 16 tons; braided well. No injury by insects. No weeds. Pastures, growth good; but quality not so good, on account of wet season. Stock thrived fairly well, and were free from disease. Quality of wool good; rather over average.

LANARKSHIRE (Upper Ward).—Wheat, none. Barley, very little grown; about the same as last year. Oats, from 36 to 40 bushels corn after lea; fully more straw than last year; corn after cleaned land very deficient from last year, owing to a deluge of rain about the middle of May; corn on cold-bottomed land was thoroughly soaked; weeds and grass choked the young braird, and in some instances half a crop was not realised; seed 5 bushels. Harvest, sixteen days after the usual time. Hay, from 1 ton 10 cwt. to 2 tons; quality good when not spoiled by rain, the early cut very much so; later cut fairly good quality, much the same as last year. Meadow-hay, fully more quantity, but not so well got. Potatoes, from 3 to 5 tons, about half of last year; disease on wet land fully $\frac{1}{2}$, on dry land $\frac{1}{4}$; it commenced about the first week of September; Magnum Bonums free of disease; Magnums and Regents prevailing here. Turnips, from 15 to 25 tons, about $\frac{1}{2}$ less than last year; braided well; no second sowing needed. Turnip crop partly affected by finger-and-toe; fully less than usual. Corn crop on cleaned lands very much injured by weeds, yarrs, and wild mustard, or wild kale; damage greater than usual. Pastures, more than average in quantity; quality not nearly so good. Stock thrived fairly well, and were free from disease. Clip of wool, average.

LANARKSHIRE (Middle Ward).—Wheat, a good crop; stood well, and was much easier harvested than last year; quality good, considering want of sunshine; threshing well; yield, about 40 bushels; seed sown, from 3 to $3\frac{1}{2}$ bushels; straw a useful crop, about 150 stones ($22\frac{1}{2}$ lb.) Barley, little grown; yield, about 40 bushels; seed sown, from 4 to 5 bushels.

Oats, a good average crop; yield, 42 bushels; quality not so fine as last season; straw a fair sample, and plenty of bulk; seed sown, 4 to 5 bushels. Harvest, a fortnight to three weeks later; a good harvest in earlier districts; high-lying places not so good, owing to break in weather. Hay, yield from $1\frac{1}{2}$ ton to 2 tons; fair quality; scarcity of clover. Meadow-hay, much about same as last season; bad weather for making it. Potatoes, yield about 6 tons on average; more than half diseased; earlier varieties a total failure; no new variety, except Bruces; did well, and free from disease; a large quantity of them will be planted this season. Turnips, yield 20 to 30 tons; braided well; no resowing; some cases of finger-and-toe. Odd cases of wire-worming; nothing more than usual. Owing to wet season, weeds very troublesome; green cropped land; only half cleaned; pearl-grass and "rack" worst. Pastures did not do well; season too cold and wet. Feeding cattle, where no oilcake was given, made no improvement; calving cattle throve fairly well. No disease, except an odd case of pleuro. Clip of wool, about an average.

LANARKSHIRE (Lower Ward).—Wheat, 32 bushels; about one-third a good deal hurt with the wet weather. Barley, almost none grown in this district. Oats, 45 bushels, and about one-third damaged with the weather. Harvest last year commenced on 18th August; this, 8th September—about three weeks later this year. Hay, $1\frac{1}{2}$ ton, and good quality of rye-grass and clover hay. Meadow-hay, $2\frac{1}{2}$ tons of meadow or Timothy hay; quite equal to last year. Potatoes, from 1 to 2 tons of the early sorts, such as Reabogs, Gryfs, and Regents; about 4 tons of the later kinds, Champions, Magnums, and Bruces; the last a new kind, something like Magnums but stronger in the shaw. No insects, only a cold wet season. Mostly annuals; weeds caused by the continual wet weather. Plenty of growth of pasture, but being always so wet, cattle did not feed well. There has been little or no disease in this district. Little or no sheep kept in the district.

RENFREWSHIRE (Middle Ward).—Wheat was a much inferior crop to season of 1889; this was due in great measure to wet weather and want of sunshine; average produce about 40 bushels; seed sown, 2 bushels. Scarcely any barley grown in this district. Oats were a fair average crop, although not equal to 1889; average produce about 32 bushels; seed sown, about 6 bushels. Harvest, about two weeks later than last season. Hay was a good crop, and the greater part well secured; produce from 2 to $2\frac{1}{2}$ tons. Meadow-hay, scarcely so productive as last season. Potatoes all over a poor crop; about one-third of last year; earlier varieties were a poor crop to begin with, and disease took the greater part of them afterwards; later varieties were better produce, about 4 tons. Turnips, although not quite equal to crop of 1889, were a very good crop where sown in time; those sown late were a middling crop; in most cases one sowing was sufficient; produce about 18 tons. No injury from insects; some from crows. Owing to wet season, weeds were hurtful to the crop. On dry soils pasture was nearly equal to last season, but where clayey or damp deficient. Stock throve fairly well, particularly on dry-bottomed land. As a rule, both kinds of stock have been healthy. About an average clip.

RENFREWSHIRE (Upper Ward).—No wheat grown. Barley, none grown. Oats, started sowing about the usual time; braided and started well, and was looking fine till the middle of June; with so much rain got quite soured, and on red land corn got yellow and the weeds and grass choked it; harvest was three weeks later, and a very wet bad harvest; in some of the highest districts was nearly wasted; they will not be more

than from 20 to 30 bushels. Harvest about three weeks later than last year. Hay, was an average crop, but was not so well got as last year on account of the cold wet season; from 30 to 40 cwt. Meadow-hay was a very poor crop, and with such a wet season was very much damaged; brought from 30 to 40 cwt.; not worth more than 30s. per ton. This has been the worst crop of potatoes for many a year—it was so wet and cold they never could get growing, and the earlier kind almost all gone with disease; Champions, about 2 to 3 tons. Turnips were also a very poor crop; braided well, but after thinning never did any good; got quite soured with the rain. No injuries from insects. Crops were a good deal injured with weeds of all kinds, being such a wet year. Pastures were quite of average growth, but cattle did not thrive so well, the land being too cold and wet. The upper district, especially the parish of Eaglesham, has suffered very much from pleuro-pneumonia, being upwards of 800 cattle killed, the larger quantity from being in contact. Clip of wool, about usual.

RENFREWSHIRE (Lower Ward).—No wheat and no barley grown. Oats after lea; the straw was not much behind the average in bulk, but the yield of grain would not exceed 23 to 27 bushels; and on red land the report of former years is applicable to this crop, and maintained its character for being poor, both as to straw and yield of grain. The harvest was, according to locality, from ten days to three weeks later, and in the West of Scotland a more protracted and inclement season has seldom occurred; the quantity of seed sown is from 4 to 5 bushels. Rye-grass hay did not come up to the quantity or quality of the previous crop, and the average weight did not exceed 1 to 1½ ton, and meadow-hay was less productive and varied in quality throughout the district. The potato crop generally was extremely bad, and early kinds, except those grown for the early market, were not worth the lifting, and this caused considerable loss, as a greater breadth was planted; the yield would not exceed 2 to 3 tons; the earlier kinds were badly diseased, fully 80 per cent; the Magnum Bonum and Champions proved less liable to disease, but the Bruce variety surpassed them, and reports of this kind tend to show that the favourable estimate formed of it last year is justified, and that in this exceptionally wet season it has yielded a fair crop, and withstood the disease better than any other variety. Turnips in the lower portion of the Lower Ward were a very inferior crop, and the best crops did not yield more than 10 tons. In the upper portion of the district the crop was better, and the yield would be about 14 tons. The sowing of turnips was not interfered with by the fly—indeed, second sowing was not required. Insects are not complained of as having done damage, and the wireworm did less damage than is usually observed. Weeds had a most favourable season, and from the wet state of the land it was impossible to check them, and they abounded in the green crops, from the potato-shaws failing very early in the season, and from the comparatively poor crop of turnips. Pastures were washed out by the incessant rain, the upper and lower part of the district differing in this respect according to the variety of moisture, a mile or two in distance showing a considerable variation. Hill sheep wintered well, and the clip was a fair average, and the price of the animal has been well maintained; wool, however, continues at a low figure. The rainfall of 1890 has been 60.98 inches, which is not quite up to the average; but a more continuous dripping year has seldom been experienced, there being only 141 dry days, and it may be said that the only succession of fine days was confined to the short period of three weeks, and took place about the last week of August to the middle of September, but thereafter an incessant rain again commenced, culminating in a rainfall of 11.59 inches in the month of November.

ARGYLLSHIRE (District of Oban).—Wheat, none produced in the district. Barley, none produced in the district. Oats, 6 bushels sown to the Scotch acre ; about 9 bushels more of a return. Harvest, a little later than the previous year. Hay, about $\frac{1}{2}$ heavier. Meadow-hay, fully $\frac{1}{2}$ more. Potatoes, not more than half of last year's ; not much disease. Turnips, average. No injury by insect, and weeds were kept down. Pastures, much better than last year. Stock throve very well, and were free from disease. Clip of wool, about an average.

ARGYLLSHIRE (District of Lochgilphead).—Wheat, none grown. Barley, none grown. Oats, land in this district varies very much ; would have been a good average crop but for the heavy rains we had the last week of September and during October, which damaged the crop so much after it was cut that farmers latterly had to cart it off the fields to get them cleared. No average yield can be given. Harvest began about the usual time. Rye-grass about the same as last year, about $1\frac{1}{2}$ ton. Meadow-hay about the same, but suffered in quality, very much owing to the weather. Potatoes, crop a failure ; disease set in latter end of August, and the crop did not mature. Turnips under average, from 16 to 20 tons ; quality good ; good braird. No injury by insects ; no injury from weeds. Pastures good ; stock did pretty well. Clip of wool, quality good, and over the average.

ARGYLLSHIRE (District of Kintyre).—Wheat, none grown in the district. Barley, fair average crop—from 32 to 35 bushels ; straw good ; seed used, about 4 bushels. Oats, this was rather above an average crop, and is threshing out well ; from 35 to 45 bushels ; grain generally light, very little above 40 lb. per bushel ; seed used, from 4 to 5 bushels. Harvest, about the usual time. Hay, a fair average crop ; from 1 ton 15 cwt. to 2 tons. Meadow-hay, average crop ; from 1 ton 10 cwt. to 2 tons. Early potatoes, a good crop ; would average about 4 tons ; late potatoes, a poor crop, especially on high-lying ground ; from 2 tons 10 cwt. to 4 tons ; there was a good deal of disease in the late crop. Turnips, a fair average crop ; from 14 to 16 tons ; the crop brairded well, and only one sowing required. No injury by insects. Weeds, much the same as usual ; more difficult to keep down owing to wet season. Pastures, very good, and above an average. Stock throve not so well as in a dry year. Cattle and sheep free from disease. Clip of wool, good ; rather above the average.

ARGYLLSHIRE (Islands of Islay, Jura, and Colonsay).—Wheat, none grown. Barley, 28 bushels ; about 4 bushels sown ; grown only on the better class of soil ; grain, lighter ; but straw heavier than last year. Oats, 30 bushels ; 6 bushels sown on land after lea, and 5 bushels on fallow ; grain, less bulky and lighter than last year, but straw heavier and coarser. The harvest was fully a fortnight later than usual. Hay, 1 ton 5 cwt. ; quality not so good as last year ; bulk about the same, but weight deficient. Meadow-hay was much more bulky than last year, but was difficult to secure, and a large quantity was injured with the continuously wet weather. Potato crop was much less productive than last year, and would barely average 4 tons, as compared with 6 tons ; disease was bad, commencing in August, and large numbers of potatoes were very small. Turnip crop brairded well, and in few cases was more than one sowing required ; average about 14 tons, being less by 4 tons than last year. Crops not more injured than usual by insects. Weeds of all kinds very plentiful, and turnips and potatoes considerably injured thereby, as, on account of the wet weather, the ground could not be cleared. Pastures of greater growth than last year, but quality of grass deficient in feeding

properties, and animals did not fatten well, and when killed weighed less than was expected. Braxy very bad; numerous lame sheep, and a number got blind; cattle comparatively free from disease. The clip of wool was under the average in quality and quantity.

ARGYLLSHIRE (District of Inverary).—No wheat sown in this district. No barley. Oats, generally a heavy crop of straw and grain; grain about the same as last year—30 to 31 bushels; straw strong and heavy; but though some was well saved, a large quantity—perhaps about one-third—of the crop much damaged by the weather: some completely lost. Harvest began much about the usual time, but perhaps a week later. Hay, a good heavy crop of rye and other sown grasses; very little clover grown here; weight, from 28 to 30 cwt. Meadow-hay, also a good heavy crop; heavier than last year; rye-grass fairly well saved; but meadow-hay—the bulk of our hay—not so well saved, and a considerable proportion entirely lost. Potatoes were a very poor crop; not more than $\frac{4.5}{100}$ of an average crop, and even this a poor quality; the early kinds in some instances gave no return; Champions did best. Yellow turnips, a fair crop; about 15 or 16 tons; quality good; little or no finger-and-toe; swedes not so good; small. No injury by insects. Green crops were a good deal damaged by weeds, the weather mostly all the season being cold and very wet. Pasture plentiful; quality not so good as last year. Stock thrive well, and were healthy. Clip of wool, quality normal, and average weight. The rainfall in this district for the first eleven months of the year is above 7 feet.

DUMBERTONSHIRE.—Wheat, hardly so much grain as last year; about 30 bushels; quality of grain and straw fully as good; 3 bushels seed. Barley, yield about 32 to 36 bushels; hardly same quality of grain and straw as 1889; 3 to 3½ bushels seed. Oats, better districts about 46 bushels; poorer hill-land about 30 to 35 bushels; quality not equal to 1889; straw more abundant, but not same quality. Harvest, a few days later than usual. Hay in best districts about 2 tons; in poorer land, about 1½ ton; early districts, quality good; in later, much damaged by rain. Meadow-hay, yield about an average, but much damaged by rain. Potatoes, about one half of last year's yield; disease very prevalent, commencing in July; early varieties in many places almost entirely gone; winter sorts, lost about a third; no new varieties. Turnips, a deficient crop; 8 to 12 tons; no resowing. No injury by insects. Weeds, more damage done than usual, owing to wet season; redshank and yarr worst weeds in green crop. Pastures, excellent early in season, but latterly suffered from excessive rain. Cattle thrive well; sheep not so satisfactory, and were leaner than usual at end of season. Cattle and sheep free from disease. Clip of wool, quality fully average.

STIRLINGSHIRE (Western District).—Wheat, none sown. Barley, about 33 bushels; fair quality; darker in colour than last year; seed sown, about 3½ bushels. Oats, about 36 bushels; fair quality; rather dark in colour; more straw than last year; generally well secured; seed sown, about 4 bushels. Harvest commenced about 8th September, a week later than last year. Hay, about 36 cwt.; well mixed with clover, and secured in good condition. Meadow-hay, a fair crop; not so good quality nor so well secured as last year. Potatoes, a very poor crop; 4 to 7 tons; small in size, and not good quality; disease, 25 per cent, setting in about 1st September; no new varieties planted. Turnips, under an average crop; 12 tons; not so good quality as last year; very backward in braiding, weather being cold. Not many insects. Green crops injured by weeds much more than usual, owing to damp cold weather. Pastures, under an

average growth. Stock did not thrive so well as last year. All stock free from disease. Better quality of wool than last year, and rather more of it.

STIRLINGSHIRE (Eastern District).—Wheat, yield 40 bushels ; quantity and quality of grain about same as last year ; 3 bushels of seed sown ; wheat has not been so much sown. Barley, yield 35 bushels ; crop was very much laid in some parts, but on account of the fine harvest weather was well secured ; 4 bushels seed sown. Oats, yield 40 bushels ; a very bulky crop as regards straw ; of good quality ; much same as last year ; 4 bushels seed sown. Harvest began about usual time. Hay, 32 cwt. ; superior quality ; well secured on carse land ; clover very weak ; aftermath very good. Meadow-hay, very fair crop, but indifferently secured. Potatoes, crop deficient, and disease very prevalent, more especially in the earlier varieties ; Magnums, 6 tons ; Champions, 6½ tons ; no new varieties in any quantity grown in this district ; prices for Champions have gone up to £6 ; swedes, 22 tons ; an average one ; braird good, and no second sowing required ; yellows, 14 tons. No damage was done by insects or by these larvæ. There was little or no damage done by weeds. Pasture was very plentiful in the earlier part of the season, but the cold summer stinted it later ; not so good as last year. Both cattle and sheep did very well, but the former left very little remuneration on account of the high inbuying price. Cattle have been free from disease, and the death-rate among sheep has been greatly reduced. The quality and quantity of the wool were very good, on account of the mild winter and fine spring following.

FIFESHIRE (Eastern District).—Wheat, 34 bushels ; straw, 1½ ton ; 3 bushels sown ; quality of grain and straw under last year. Barley, 32 bushels ; straw, 1 ton ; 3 bushels sown ; quality of grain and straw under last year. Oats, 40 bushels ; straw, 1½ ton ; seed, 4 bushels. Harvest, a week after the usual time. Hay, a good crop ; about 2 tons ; quality not so good. Meadow-hay, about 1½ ton ; scarcely any grown. Potatoes, about 5½ tons ; quantity under last year ; the Regent variety is very much diseased, others almost free ; Bruce is the only new variety, and is an excellent cropper. Turnips, about 16 tons ; quality much the same as last year ; the crop brairded well ; no resowing. No injury by insects or weeds. Pastures, of average growth and quality with last year. Stock throve only middling ; under the average of seasons. Cattle and sheep free from disease, except one or two cases of pleuro-pneumonia. Clip of wool, quality good ; an average clip.

FIFESHIRE (Middle District).—Wheat, a full average crop ; 32 bushels ; quality of grain and straw good ; equal to the crop of previous year ; the weight of straw about 1½ ton ; seed sown, generally broadcast, about 3 bushels. Barley, also an average crop ; the yield about 33 bushels ; weight of straw about 1 ton ; quality of grain excellent ; good colour, and weighs well ; seed, when sown broadcast, 3 bushels ; by drill, 2 to 2½ bushels. Oats, the best crop of the cereals ; a large crop ; yield of grain 46 bushels ; quality of grain and straw very good ; weight of straw fully 1½ ton ; seed, 4 bushels, generally sown broadcast. The harvest began about the 1st of September, and may be said to be an average one as to time of beginning. It was an excellent one so far as weather was concerned. Hay crop was not so heavy as last year ; there was much less clover, and the weight would not be above 1½ ton ; it was well got, and the quality is excellent. Meadow-hay, none cut in the district. Potatoes, not so heavy as last year ; the early varieties were a very small crop, about 4 tons, and when dressed for market were not above half of them sound ; the disease commenced about 1st September ; later sorts were a fair crop ;

very little disease, and would yield $5\frac{1}{2}$ tons; the new sorts planted were Bruces, Sutton's Abundance, and Main Crop Kidney. Turnips, a very large crop; heavier than that of 1889; quality generally good; more diseased crops than in the former year; swedes would weigh from 16 to 25 tons, and yellows about from 16 to 18 tons; crop braided well; no second sowing. The crops were not injured by insects, although in almost every field of barley you could find, without much difficulty, the eggs of the Hessian fly. No injury by weeds. There was plenty of pasture; but I suppose, owing to the cold nights, stock did not thrive so well as they might have done, but were free from disease. Clip of wool about an average.

FIFESHIRE (Western District).—Wheat, 34 bushels; $1\frac{1}{2}$ ton straw; grain better quality, and more of it than last year; straw about the same; seeding, 3 bushels. Barley, 32 bushels; 1 ton straw; quantities much as last year, but neither quantity nor quality any better than last year; on some fine lands quality is not so good; seeding, 3 to $3\frac{1}{2}$ bushels. Oats, 44 bushels; quantity and quality of grain quite as good as last year, with a little more straw; seeding, 4 bushels. Harvest, a few days later than usual. Hay, $1\frac{1}{2}$ ton; fairly well got, and mostly of best quality; the heavy lying crops of barley last season caused blanks amongst young grass. No meadow-hay. Potatoes, 6 tons or thereby, of excellent quality; practically no disease, except among Regents; several newer varieties, as Clark's Main Crop, and Bruce, have done very well—Lady Fife also promises well. Turnips, 16 tons; a fine crop; heavier than last year, and fine quality. No apparent damage by insects. Wild mustard and colt's-foot were apparent, but not to an unusual extent. Pastures, full average growth and quality. Stock thrived well, and as a rule were free from disease, though there have been a few cases of lung disease. Clip of wool, fair average.

PERTSHIRE (South-West District).—Wheat, quantity and quality much the same as previous year, 1889; weight about 62 lb.; seed, about 4 bushels; yield about 30 bushels. Barley, a good crop of both grain and straw; yield about 36 bushels; weight, say 55 lb.; seed, 3 to 4 bushels. Oats, an average crop of grain and straw, but in some cases slightly damaged with wet weather; weight, natural, about 42 lb.; seed, 5 bushels. Harvest, about a week later than previous season, and was rather protracted owing to broken weather. Hay, a fair crop, but short of clover in many instances; say 1 ton 10 cwt.; generally well got. Meadow-hay, about the same in quantity as in 1889, but in many cases badly damaged by the rainy weather. Potatoes, yield much lower than previous year; much diseased, say a half; showed signs of disease all along. Turnips, capital crop; about 20 tons; free from finger-and-toe; braided well, and only once sown. Crops not injured by insects. Weeds in great quantities, and turnip land very difficult to clean owing to so much moisture. Pastures plentiful, but no feeding; too wet. Stock thrived fairly well, but did not take on flesh on account of the ground being so long damp. Cattle and sheep free from disease in this district. Clip of wool, a full average in quantity and quality.

PERTSHIRE (District of Coupar-Angus).—Wheat, about average crop; from 35 to 40 bushels; straw, average; seed from 3 to 4 bushels; so little of the wheat crop being threshed, we cannot be very particular about quality. Barley, fully average; from 40 to 48 bushels; straw fully average; seed generally 3 bushels. Oats, above average; 48 to 56 bushels; straw above average; seed, 4 bushels. Harvest about ten days later than last year; general about 1st September. Hay, average crop; from 2 to $2\frac{1}{2}$

tons ; quality good. No meadow-hay. Potato crop, from 4 to 10 tons ; Regents about one-eighth diseased. Turnips, 16 to 22 tons ; no resowing ; braided well. No damage by insects. Crops injured a little by wild mustard. Pastures better than last year. Stock thrive not particularly well on account of so much wet weather, but were quite free from any disease. Clip of wool, about average.

PERTSHIRE (Western District).—No wheat grown. No barley grown. Oats, an average crop. The harvest was a fortnight later. Rye-grass and clover very good, but damaged by weather in many places. Meadow-hay an average, but difficult to secure. Potatoes, a very inferior crop, and bad with disease. Turnips, a good crop, and in some places more than one sowing was required. Crops were not much damaged by insects. No damage by weeds to any extent. Pastures, an average quality. Stock did not thrive so well owing to the wet season. Both cattle and sheep have been free from disease. The clip of wool was very good, and fully above an average in most places.

PERTSHIRE (District of Strathearn).—Wheat not grown to any extent in the district ; average crop ; 32 to 34 bushels ; 3 bushels sown. Barley, an average crop ; 38 to 40 bushels ; not well coloured, and on heavy land very much laid ; $3\frac{1}{2}$ to 4 bushels sown. Oats, a very good crop both for quantity and quality ; 42 to 44 bushels ; straw good, but in some cases considerably damaged by wet weather ; 4 to 5 bushels sown. Harvest was from ten days to a fortnight later than last year ; on the whole, weather favourable. The hay crop was about an average, and well secured, but in many cases showed a great want of clover ; about 2 tons. Meadow-hay an excellent crop, but in consequence of wet weather not well secured in many cases. Potato crop much under an average, and very much diseased, especially Regents in strong land ; disease began early ; on light sandy soil disease much less than on heavy land ; 2 to 4 tons. Turnip crop a very large one ; braird very good throughout, and little or no second sowing required ; bulbs large, but soft and of inferior quality ; weight 20 to 25 tons. In some places wireworm considerably damaged crops, but generally the loss was small. Oats and barley, especially after green crop, suffered from wild mustard and other weeds, but lea corn was less affected. The pastures were on the whole good, and showed a luxuriant growth, but wet weather during the latter portion of the season had a deteriorating effect upon cattle intended for the fat market. Cattle and sheep thrive fairly well. Both cattle and sheep kept free of disease. The clip of wool was about an average, and of fair quality.

PERTSHIRE (Highland District).—Wheat, none grown. Barley, not a satisfactory crop ; average weight 52 lb. ; 28 to 30 bushels ; straw fair, but thin on the ground ; deficiency owing to wet season and want of sunshine. Oats, lea best crop of the season ; weight 41 to 42 lb. ; 50 bushels ; straw very good, and harvest weather generally ; red-land straw not so good ; 39 to 40 bushels ; 44 bushels ; straw thin in general. Harvest nearly a fortnight later, and more so on high places, where the weather was bad, and delayed ingoing very much. Clover-hay crop, 28 to 35 cwt. ; quality good, and well got in clover. Meadow-hay good ; 35 to 40 cwt. ; about the same as last year, and well got in ; price very low. Potatoes, crop bad ; $3\frac{1}{2}$ tons to 4 tons ; Regents diseased more than others. Turnips, very good ; 15 to 18 tons ; no finger-and-toe ; no second sowing. No injury by insects. Weeds gave some trouble owing to wet season, but well kept down. Pastures good and bulky as compared with last season, but did not fatten. Stock thrive very well, but did not feed well. Cattle and sheep free from disease. Wool, very good clip ; better than last year.

PERTSHIRE (District of Dunkeld and Stormont).—Wheat, 26 bushels ; straw abundant and well got ; quality of wheat fair, 61 lb. average ; not much sown in this district, and mostly red wheat ; not enough sunshine ; about 4 bushels sown. Barley, a good crop ; straw abundant, rather luxuriant, inclined to lodge, but well got ; 36 bushels of from 54 to 56 lb. ; colour not so good as we have seen ; 4 bushels sown. Oats, a splendid crop, the best for many years ; straw abundant and well got ; 44 bushels of from 42 to 45 lb. ; colour good ; 5 bushels sown. The harvest was later than usual by two weeks—about the 5th of September. The hay crop was fair, but a want of clover ; 1 ton 3 cwt. Meadow-hay, little or none grown. The potato crop was under an average, 5 tons ; there was a good proportion diseased, about one-third of Regents ; commenced about the middle of August ; Magnums and Champions were almost free of disease ; the Bruce, a new variety, entirely free of disease, and a good crop of 7 tons. Turnip crop good ; about 18 tons 10 cwt. ; quality good ; the crop braided well ; no second sowing ; a shower every other day. No injury from insects. No injury from weeds of any consequence. Pastures, average quantity, but deficient in quality. Stock thrived only fairly well, rather wet. No disease in this quarter. Clip of wool, a full average.

FORFARSHIRE.—Wheat, 36 bushels ; quality fair ; seed sown, from 3 to 4 bushels ; about 2 tons of straw ; medium quality. Barley, 40 bushels ; quality good ; seed sown, 4 bushels ; 2 tons ; average quality. Oats, 56 bushels ; quality very good ; seed sown, 5 bushels ; 2 tons ; quality not so good as last year. Harvest about a week or ten days later than last year. Hay crop varied very much in this district, some being well mixed with clover, while others had nothing but rye-grass. The average would be about 1 ton 15 cwt. Meadow-hay not grown in this county to any extent, if any. Potatoes, the average would be about 6 tons ; disease was most abundant amongst Regents—it commenced in July ; the other varieties did not suffer to any extent, but in many cases the tubers are small. Turnip crop will average about 18 tons ; with very few exceptions the seed braided rather irregularly, but a second sowing did not have to take place ; some finger-and-toe appeared in this district, but slight. The crops have generally been free from insect pests. All over the crops were good. No injury from weeds. Pastures, the growth was above an average season, with the exception of a week or two in July, when it was very cold and wet. Stock did not do so well owing to the cold and wet. Cattle have been *comparatively* free from disease. Sheep on a great many farms have suffered more than usual from foot-rot. Clip of wool, quality good, and a good average.

ABERDEENSHIRE (District of Buchan).—Wheat not grown. Barley and bere, fair crop ; not quite so good quality and colour as last year ; the yield of each will not be equal to that of last year by some 4 bushels' weight, about 53 to 54 lb. ; average 36 bushels ; sown, from 3 to 5 bushels. Oats, a bulkier crop than last year, even good as that was, and proving equally well as to yield ; straw in excess of last year, and of fair quality, the crop having been got secured in most cases in goodish condition into the stackyard ; weight of oats, 40 to 44 lb. ; sown, from 5 to 6 bushels. Harvest commenced last year about 1st September ; this year about 13th September ; finished about 19th October. The hay crop was more than an average, both as to quantity and extent, owing to the previous winter's keep enabling stock to be kept inside longer than usual ; a greater extent of new grass was kept for hay, and secured only in fair order, owing to the wetness of the season ; well mixed with clover ; the yield would be from 30 to 35 cwt. Little meadow-hay in the district. The yield of the potato crop was not equal to an average crop, either as to quantity or quality ;

although disease manifested itself during the earlier part of the season, fortunately it did not take hold to any extent, except among the earlier varieties; cultivated for home use, not for sale to any extent. The turnip crop is generally a very heavy one; even heavy as last year's was, this year's is fully heavier, but not quite of so nutritious a quality, the season being too wet and not so much sunshine as turnips, especially swedish, require; weight of swedes, 22 to 28 tons; yellow, from 21 to 28 tons, and in some particular cases exceeding that weight; the braird came away very evenly, and the result was that very little resowing had to be done. Little or no injury done by insects. In many fields the weeds were too prominent throughout the season, owing to the wet weather during the greater part of the summer. The pastures were, as a rule, of luxuriant growth, and were very plentiful throughout the season. Stock did not make that progress which the fulness of grass would have warranted; but stock never do so well in a wet season with apparent fulness of grass, as they do during a warmer season and with less fulness of grass. Stock comparatively free from disease this season, except a few outbreaks of pleuro that occurred in the district. Clips of wool equal to an average, while the price is not so good as it was last year.

ABERDEENSHIRE (District of Formartine).—Wheat, not grown to any extent in this district. Barley and bere much cultivated; this crop was very good; on good barley land the quantity of straw was above the average of last year; while the weight of the grain would exceed the weight of last year by 4 or 5 lb. per bushel, this year 54 to 56 lb.; the quantity would be about 36 to 40 bushels; although this crop stood long in the stook for want of drying and breezy weather, it was stacked in good condition; quantity sown, 4 bushels barley and 3 bushels bere. Oats were a bulky crop both after lea and cleaned land; the straw was abundant; the weight of grain and return much over last year's crop, the weight from 42 to 44 lb., and the return of grain from 36 to 40 bushels. This crop was one of the largest and bulkiest crops that has been grown in this district for a number of years; the reporter does not remember seeing such large and well-filled stackyards in the district; during harvest the weather was mild and warm; dry breezy weather was wanting, so that the crop stood long in the stook, but was generally well secured in the stackyard; quantity sown, 5 to 6 bushels. Harvest commenced last year on the 2d October, this year about the second week of September. The hay crop was secured in good order, and was about an average; $1\frac{1}{2}$ to 2 tons. No meadow-hay. The potato crop generally was under an average; on dry thin land the crop turned out best; on deep loamy soils the return was disappointing; the Champions were free from disease, while the early sorts—such as Forty-folds and Kidneys—were much diseased; quantity about 5 or 6 tons. The turnip crop is a fair crop; the swedish variety is the heaviest; the yellows not so heavy; a good many of the yellow turnips have rotted, owing to the continued wet weather since harvest was finished; weight of the swedish from 17 to 20 tons, the yellows from 15 to 17 tons. No injury done by insects. Weeds were not difficult to be kept under this season. The pastures were good during the first part of the season, and remained fresh during the latter part of the autumn. Cattle and sheep have been free from all infectious diseases. The clip of wool was above average.

ABERDEENSHIRE (District of Garioch).—No wheat grown. The crops of barley were generally good, and yield satisfactory, reaching to 42 bushels, or 2 bushels in excess of last year, and weighing 54 to 56 lb.; the usual seeding is 4 and $4\frac{1}{2}$ bushels. The crops of oats are also better than last year, both in quantity of straw and yield of grain, and would represent an increase of grain to the extent of 4 bushels, which would correspond to 36 bushels;

quantity used for seed, 6 bushels. Harvest was commenced about a fortnight later than the usual time ; but the harvest was favourable, and crops secured in generally good condition. The hay crop was secured in better condition than last year, consequently the quality is improved, whilst the mixture of rye-grass and clover was well maintained ; the yield would be somewhat above that of last year, and the out-turn would probably be $1\frac{1}{2}$ ton. No meadow-hay. A deal of the potato crops was lifted in very bad condition, and the crop was not equal to that of last year, and in many cases disease was present to a greater or less extent, and the yield $4\frac{1}{2}$ tons, or $1\frac{1}{2}$ ton under last year. The Garioch Turnip-Growing Association report an excellent crop of turnips ; although not quite equal to last year, is above an average of a series of years, whilst the quality is superior ; but it is to be regretted that the continuance of bare and severe frost has injured their vitality to a great extent ; 17 tons in November might have been written, but from the cause stated a test in the latter part of January would show a very diminished result. The crop braided well, and no second sowing required. Land in the Garioch district is generally kept clean, and no damage from weeds was sustained. The pasture-grass was unusually good throughout the whole season, and much above an average ; but cattle did not make the improvement which might have been expected ; and sheep suffered, and lost condition from the prevalence of foot-rot. The quality and clip of wool were similar to last year.

ABERDEENSHIRE (District of Strathbogie).—No wheat grown. There is not any barley grown. Formerly there used to be a considerable extent of the clean land break put under bere, but now the area is diminishing. The crop has been good and the quantity of grain satisfactory, averaging probably 40 bushels of marketable grain. Oats have been a very good crop. Generally there is abundance of straw of fine quality. It is seldom indeed that there is so much good grain in the district ; the yield would probably be over 5 quarters, and the weight from 40 to 42 lb. Harvest began about the usual time. The weather during the first month was good, but afterwards a considerable quantity of rain fell at frequent intervals, so that those farmers who had not their crops all secured before the rains, had great difficulty in clearing the fields of stooks. Hay was a fair average crop, and the clover was generally abundant ; the crop was well secured. Potatoes in several cases were badly diseased, and on most farms they will be scarce in spring for planting. Those farmers who were fortunate to have Champions fared generally much better than those who had none of that disease-resisting variety. The Bruce potato is being introduced successfully in the district, and where it has been tried it promises to do well. Turnips generally are a good crop and of excellent quality. Swedes might weigh 25 to 30 tons under favourable circumstances, and yellows might reach from 22 to 25 tons. The plants came nicely to the hoe, and in no case was second sowing rendered necessary. During the whole of the season pasture-grass did well, thanks to Mr George Bruce, seedsman, Aberdeen, who early in the day studied the question of natural grasses and observed their habits in different soils. He was thereby enabled to advise his customers in the choice of natural grasses, and now almost every farmer uses a mixture of them, and considerable benefit results therefrom, especially upon poor and exposed fields, where the herbage is of infinitely better quality and much more abundant in growth. Stock did well upon the pastures. The feature of the grazing season has been the introduction of Canadian stores to the grass fields. Upon the farms of Brawland Knowes and Collithie a considerable number of these Canadian cattle were grassed with satisfactory results. It was noticeable that the very lean animals did better on the pasture than home-bred cattle in a similar condition. The clip of wool

was over an average in weight. The fleece being remarkably close, consequently added perhaps a pound to the average weight. Sheep are increasing in number in the district, and the tendency is to still further increase the flocks, as the financial results have been more satisfactory than from cattle-feeding during the past four or five years.

BANFFSHIRE (Lower District).—Wheat, about 36 bushels; quality good; 63 lb. per bushel; seed sown, 3 to 4 bushels. Barley, about 38 bushels; quality and weight under 1889, but fair; 53 to 57 lb.; straw one-fourth more than last year; seed sown, 4 bushels. Oats, about 44 bushels; quantity 8 or 10 bushels over last year; quality better and heavier; straw, one-third more; seed sown, $5\frac{1}{2}$ bushels. Harvest began about beginning of September, or fully one week later than last year. Hay, say 15 cwt.; quality fair, but somewhat deficient in clover. Potatoes, 4 tons, or 1 to $1\frac{1}{2}$ under last year; earlier varieties a good deal diseased; late varieties did well, especially Champions; disease was observed about beginning of August; the Bruce potato was tried and gave excellent results, no disease being detected; quality of whole crop good. Turnips, about 15 tons; 2 to 3 tons under last year (1889 was an exceptionally good turnip year); quality not so good; braided well, and scarcely any resowing. No damage done by insects. No damage from weeds. Pastures, average. Stock thrived fairly well, but season rather wet for pasture feeding. Cattle generally healthy, as also sheep. Wool, good quality, average.

BANFFSHIRE AND MORAYSHIRE (Upper District).—No wheat. Barley, full crop of straw, and fair crop of grain; about 36 bushels; grain, average quality and weight, but deficient in colour, owing to extra rainfall during the latter part of summer and harvest. Oats, full crop, both straw and grain; about 36 bushels on light soils, and 44 bushels on good land; quality of grain excellent, but colour slightly affected by harvest rain. Harvest, about ten days later than usual, but much delayed by wet weather. Hay, average crop of clover and rye; quality good of early saved crops; later cuttings hurt by wet. Meadow-hay, none grown. Potatoes, quantity about $\frac{2}{3}$ of an average crop; all partly diseased, varying from $\frac{1}{3}$ to $\frac{2}{3}$ of the tubers; the crop would average about 4 tons, but few grown for sale. Turnips, fair average crop as to weight; on good land about 20 tons, and 12 to 15 tons on light soil; canker and finger-and-toe were present on many farms, but the disease did not increase throughout the autumn, and did not thereby greatly lessen the value or weight of the crop. No injury by insects or weeds. Pastures, a full average, both as to quantity and quality of grass. Stock thrived fairly well, but season rather too wet for both cattle and sheep. Cattle and sheep were free from disease. Clip of wool, fair average.

MORAYSHIRE (Lower District).—Wheat was a deficient crop as to out-turn of grain in general, the weather during the blooming season being wet and sunless for the most part, which caused a great deal of rust, greatly reducing both quantity and quality of grain; there was a full average of straw, which, being well harvested, was of good quality; the average of grain would be 1 quarter below last year's crop, and much inferior in quality; would not exceed 4 quarters; the quantity of seed used, 3 to 4 bushels. Barley was a good crop, especially on light land, the best that had been seen for many years; the quantity of straw was above the average, and of good quality; the average of both straw and grain much above last year, which was exceptionally dry; the grain was heavy, 56 to 58 lb., but the colour rather deficient in brightness, the result of a heavy rainfall immediately before harvesting, continuing for some time; the quantity of grain, 4 quarters 6 bushels; seed used, from 3 to 4 bushels. Oats, except

on rather damp land, were a good crop, much over the average, the result of the rather moist season; both straw and grain were of good quality as compared with last year; the grain would average 2 quarters more; the quantity would be 5 quarters, and quality 42 to 44 lb.; quantity of seed used, from 3 to 5 bushels. Harvest began about the usual time, or a little later; a heavy rainfall at the commencement kept back some of the earlier farms for a few days, but after that the weather was exceedingly favourable, and the crop could not have been secured in better condition. The hay crop was in many cases double that of last year, which was unusually light on account of the dry season. Rye-grass and clover well mixed; both luxuriant and of good quality, being well harvested; the quantity would be 2 tons. Little or no meadow-hay. Potatoes—disease to a considerable extent overtook the potato crop before being fully matured, especially the earlier sorts, Fortyfolds disappearing almost entirely; Magnus and Champions stood out best; quality on the lighter soils fair; the quantity from 4 to 5 tons; Champions at present selling at £6 to £6, 10s. per ton. The turnip crop would be about an average, rather under last year; swedes quite free from disease, but in many cases a good deal of canker among the yellows. Whatever may be the cause, a great many farmers say that their cattle have not made the usual progress in feeding this year; swedes would be from 20 to 24 tons; yellows, 16 to 20 tons; there was no second sowing required. No special damage from insects observable. Weeds were rather difficult to keep under, on account of the rather damp season; damage not greater than usual. Pastures were fully an average growth, much above last year, and stock made fair progress upon them. Cattle and sheep quite free, no disease of any kind. The clip of wool about average.

NAIRNSHIRE.—Wheat, none. Barley, 36 bushels; rather over last year; quality about equal; straw better, and nearly double quantity; 4 bushels. Oats, 40 bushels; rather over last year; quality better, and more straw; 5 to 6 bushels. Harvest, four days later than last year. Hay, rather over last year in quantity; quality better. Meadow-hay, none. Potatoes, 2½ to 3 tons; equal to last year; some disease in earlier varieties. Turnips, 15 tons; quality better; braided well; no second sowing. No injury by insects, and not to any great extent from weeds. Pastures, rather over the average growth. Stock thrived well, and were free from disease.

INVERNESS-SHIRE (District of Inverness).—The quantity of wheat sown in the Inverness-shire district is very small; the quality for 1890 was equal to former years, while the yield was about an average, both as regards grain and straw; some 36 bushels would be about an average yield; the quantity of seed usually sown with winter wheat is 4 bushels. There was a full average return of barley in this district, and some very heavy weights on early soils were received, but on later and moist soils the weights were disappointing, while the colour was not so good as an average of years; quantity sown, from 3 to 4 bushels; average yield, 34 bushels. The oat crop was a very good one, and some very fine fields throughout the district were harvested; the return would average 40 bushels on average land; from 3 to 5 bushels are usually sown, according to soil. The harvest was about a fortnight later than usual. The hay crop was a fair one on well-manured land, but under an average on lighter and ill-conditioned soils. No meadow-hay grown. Potatoes, about 5 tons; about an average yield for ordinary sorts, and for Bruce saved, 7 to 8 tons were common; there was a good deal of disease among Regents and early sorts; several new varieties were planted, chiefly Bruce and Blues, with favourable results. The turnip crop was lighter than last

year by some 5 tons ; with few exceptions, turnips braided all right, and no second sowing took place ; the quality was good till the frost came and checked storing. No insects apparently interfered with the crops in 1890. A good many weeds, principally wild mustard and knot-grass, were prevalent, and encouraged by the damp weather. The pastures were an average growth, but they did not have the feeding quality of the former year. Stock did not thrive very well, and paid nothing for their keep, but were free from disease. Clip of wool, about an average, attributed to the previous good winter.

INVERNESS-SHIRE (District of Beaulieu).—Wheat, none in district scarcely. Barley, 30 bushels of moderate quality. Oats, 40 bushels of good quality. Harvest began 1st September, three weeks later than last year. Hay, $1\frac{1}{2}$ ton ; fine quality ; much about the same quantity as last crop. Meadow-hay, much about the same, but very little grown. Potatoes, 4 tons of second-class quality ; a good deal of disease ; a few new varieties introduced with very healthy results. Turnips, 4 to 5 tons less than last year ; say 15 cwt., of poor quality ; no second sowing required. Some cases wire-worm, in a few fly, and in a great many finger-and-toe. A damp season, and weeds plentiful. Pastures rather over average growth, but of inferior quality, and stock thrived badly. Stock thrived not well, but quite free from disease. Clip of wool good ; about an average.

INVERNESS-SHIRE (Skye).—Wheat, none sown. Barley, very little sown. Oats, above an average, but greatly damaged while securing them by bad weather. The harvest was later by three weeks. The hay crop was a poor one from the first, and suffered while securing it from bad weather. Meadow-hay was better than last year, but suffered in securing it, and rendered almost useless. The potato crop was very far deficient to what it has been for several years. The turnip crop much the same as last year. No damage done by insects. No particular damage from weeds if the crop was attended to. Pastures during the season of average growth and quality. Stock thrived very well, and were free from disease. Clip of wool, about an average.

INVERNESS-SHIRE (Lochaber).—Wheat, none grown. Barley, almost none grown. Oats, about 32 bushels ; quality both of grain and straw at harvest-time very good, but in many places sadly injured before being stacked ; seed, 6 bushels ; a good deal of sprouting or second growth in stook. Harvest ten days later than usual time. Hay, about $1\frac{1}{2}$ ton ; quality better than last year. Meadow-hay, good crop, but greatest difficulty in securing it, owing to constant wet ; in many places in the West it could not be saved at all. Potatoes, yield scarcely a half of last year ; about $3\frac{1}{2}$ tons ; fully $\frac{1}{4}$ of early varieties diseased ; disease commenced in July. Turnips, about 12 tons ; not a good crop over whole district ; very little resowing needed anywhere. No damage from insects. No injury by weeds. Pastures of average growth and quality. Stock thrived fairly well, and were quite free from disease. Clip of wool, average.

ROSS-SHIRE (Western District).—Wheat, none sown. Barley, little or none sown. Oats, quantity 24 bushels ; seed sown, 7 bushels ; quality fair. Harvest a month later than usual. Hay, quantity $1\frac{1}{4}$ ton ; quality inferior to last year. Meadow-hay more productive. Potatoes, about $1\frac{1}{4}$ of last year's crop, say 3 tons ; no disease ; no new varieties planted. Turnips, say 5 tons, and quality bad as compared with last year ; crop braided very indifferently ; only one sowing. No damage by insects. Weeds of various kinds, principally chickweed ; damage greater than usual, the season being exceptionally wet. Pastures were of average growth

and quality. Stock thrived well, and were free from disease. Clip of wool, quality good, and fully above the average.

ROSS-SHIRE (Districts of Dingwall and Munlochy).—Wheat, breadth much as last year; quality of grain barely average; quantity of straw average; seed about 4 bushels. Barley, quantity about average, say 38 bushels; quality barely average; quality of straw not average; quantity bulky; seed $3\frac{1}{2}$ to $4\frac{1}{2}$ bushels. Oats, quality about average; quantity above average, say 34 bushels; quantity of straw 20 per cent over average, and quality in consequence rough; seed $3\frac{1}{2}$ to 5 bushels. Harvest began some days later than average. The crop of hay was average, about $1\frac{1}{2}$ ton; was secured with difficulty, and much spoiled in quality with rainy weather; clovers were not so plentiful. Meadow-hay, none. Potatoes, the yield was much less, say 5 tons; disease attacked the crop very early, and the early varieties were affected to the extent of 50 per cent. Turnips were below average, say 14 tons; the crop braided well; finger-and-toe was rather prevalent. Owing to wet season weeds were more troublesome, annuals especially. Pastures, the growth was more luxuriant, but not of such fine quality. Stock did not thrive so well owing to the wet and cold season, but were free from disease. Clip of wool, just average.

ROSS-SHIRE (Tain, Cromarty, and Invergordon).—Wheat, 4 quarters 4 bushels; average quality; 4 bushels seed. Barley, 4 quarters 6 bushels; not good quality; more than average straw. Oats, 5 quarters; very good quality; straw above average. Harvest quite a week later. Hay, $1\frac{1}{2}$ ton; not well got. Meadow-hay, none grown in district. Potatoes, not much over half the weight of last year's crop; early kinds badly diseased; late kinds quite sound; nothing newer than the Bruce. Turnips, 15-20 per cent less weight than last season; crop braided well; no second sowing. Weeds principally annuals; injury greater than usual. Pastures more than average growth, but worse quality. Stock thrived not well, season so cold and wet. Clip of wool, average.

SUTHERLANDSHIRE.—Wheat not grown in the county. Barley, quality of grain and straw was good, better than last year; an average crop would be about 34 bushels; seed, 4 bushels. Oats, a fairly good crop, and grain of good quality; average crop about 40 bushels; seed, 4 to 6 bushels, according to quality of land. An early harvest and most favourable weather. Hay was rather heavier than last year, and quality unexceptionable. Meadow-hay considerably more productive. Potatoes are not grown for sale; quality was good, and a fair quantity. Turnips—it is difficult to state an average weight for the whole county, but it was below an average, and yellows were by no means sound. No injury by insects; nothing unusual by weeds. Pastures, much better than last year. Cattle thrived well, sheep fairly well, and both were free from disease. Clip of wool—the quality was very good, and the weight considerably over an average.

CAITHNESS-SHIRE.—No wheat sown. Barley, quantity of grain about same as last year, say about 40 bushels; quality not so good; straw considerably over last year; about 4 bushels of seed sown. Oats, quantity and quality of grain about same as last year, say about 34 bushels; straw about one-fourth more than last year, and good quality; about 5 bushels of seed sown. Harvest about two weeks after the usual time. Hay crop would be full 10 cwt. above last year—that is, clover and rye-grass respectively—but quality not so good owing to bad hay harvest. Meadow-hay crop more productive than last year; quality rather inferior in con-

sequence of wet season. Potatoes not half a crop, and in some localities a complete failure, disease having commenced about the fourth week of August. The crop is so very irregular all over the county, that I consider there is not over one-third of last year's weight of crop; Champions have proved better than any other variety. Turnips as compared with last year would be about 4 tons less, and quality inferior owing to the extreme wet season; braided fairly well; resowings in a few exceptional cases were resorted to in consequence of frost. Very little injured by grub insects, but to some extent by frost in various localities. No injury by weeds. Pastures were fully of average growth with last year. Stock did not thrive in the pastures in consequence of the cold wet sunless season. Cattle and sheep have been free of disease. The clip of wool was good quality, and over the average.

ORKNEY.—Wheat, none. Barley, little grown; bere; seed, $3\frac{1}{2}$ to $4\frac{1}{2}$ bushels; average crop; 36 bushels, 49 lb. per bushel, being about the same as last year. Oats, seed 4 to 6 bushels; average crop; 30 bushels, 40 lb. per bushel, being rather better than last year; there was every appearance of an extra good crop, but unfortunately, when about half cut, a violent storm, followed by some hail-showers, shook badly the uncut grain, especially where it was ripe and exposed; there is a good average bulk of straw, fully $\frac{1}{3}$ more than last year. Harvest began two or three days after the usual time. There was an early and exceptionally large crop of hay, averaging 1 ton 10 cwt., being three times the quantity of last year. Meadow-hay—there is only some coarse stuff grown on wet meadows. Potatoes, average crop; 5 tons, being about half the quantity of last year; the shaws were blighted, and in some places near the sea-shore destroyed by the gale and salt-water spray of 25th June; there was also some disease in the autumn. Turnips, average crop; 10 tons, being $\frac{1}{3}$ less than last year; the crop braided fairly well, but the early sown was much damaged near the sea-shore by the gale of 25th June; the crop is somewhat injured by finger-and-toe, owing principally to the damp state of the land when the crop was laid down. Very little damage by insects. Weeds, damage not more than usual. Pastures grew early and rapidly, and were much more abundant than last year. Stock thrived fairly well, but not so well as was to be expected from the abundant crop of grass. This was owing to the grass being too rich at first—seeding very early—and being blighted by the gale of 25th June. Stock thrived better in the autumn when the weather was fine, and there was an abundant crop of aftermath. There was a good deal of illness, with several deaths, last winter, caused by the cattle getting a larger proportion of turnips than straw—the former being a most abundant and the latter a very short crop. Clip of wool, average.

SHETLAND (District of Lerwick).—Wheat, none. Barley, quantity larger than last year, both in grain and straw—straw very much so; quality of grain good, but not equal to last year, which was a very dry and hot season. Oats, the same as barley. Harvest was about ten days before the usual time. Rye-grass and clover were both a good crop; much larger yield than last year, and got in in better condition. Meadow-hay a good crop, and much more than last year. The potato crop was not so large as last year, and the quality not so good, but still a good crop, both quantity and quality; slight disease commenced in some places about the middle of August, but did not spread to any extent; no new varieties planted. Turnip crop very satisfactory, but not so heavy as last year; quality good; crop braided well; only one sowing required. No damage by insects. Rather more chickweed waste than usual, and troublesome to keep green crops clean, but no great damage.

Pastures were much better than last year, and above an average both in growth and quality. Stock of all kinds healthy, and fed well on the pastures. No disease of any kind. The quality of the wool clip was very good, and the quantity over an average.

THE METEOROLOGY OF 1890.

The following table shows the winds and sunshine of 1890, as compared with the averages of previous years. From it we learn that E. and W. winds were 13 days and calms 10 days more frequent than usual, and N.E., S.E., S., and S.W. winds 22 days less frequent than usual.

TABLE SHOWING FOR WIND DIRECTION AND FORCE, AND FOR SUNSHINE, THE EXCESS ABOVE, OR THE DEFECT FROM, THE AVERAGES OF PREVIOUS YEARS.

	DIRECTION OF WIND—DAYS.								Calms—Days.	Force.	Hours of Sunshine.
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.			
January . .	-1	-2	-1	-2	1	3	3	-1	0	lb. p. sq. ft. 1.61	-16
February . .	0	0	3	1	-1	-2	-2	-1	2	-0.42	-4
March . . .	-1	-1	-1	0	0	1	1	0	1	0.61	-19
April . . .	1	-1	1	0	-1	-1	0	0	1	0.26	9
May	0	0	3	1	0	-2	-2	-1	1	0.12	-26
June	0	0	-1	-1	-1	1	2	0	0	0.77	-70
July	1	0	-1	-1	-2	0	1	2	0	0.57	-56
August . . .	0	0	0	-2	-1	-1	2	1	1	0.08	-31
September .	-1	-2	0	0	1	0	2	-1	1	0.35	-16
October . .	2	-1	-2	-3	-2	0	4	2	0	0.65	-23
November .	0	-1	0	0	1	0	-1	0	1	0.58	-19
December .	-1	1	5	1	1	-4	-3	-2	2	-0.30	-30
Year . . .	0	-7	6	-6	-4	-5	7	-1	10	0.41	-321

These figures show that in 1890 there was an unusual prevalence of calms and E. and W. winds, amounting in all to 23 days, and a deficiency of N.E., S.E., S., and S.W. winds, amounting to 22 days. Over the whole of Scotland the temperature of the year was above the average of past years. The greatest excess was 1°.0, experienced over the north-west from Barrahead to Shetland, from which it gradually diminished on advancing towards the south-east, till along the Cheviots the mean temperature of the year was only the average. In England and

Ireland temperature was under the average, the greatest deficiency being in the southern counties of England, amounting to $1^{\circ}.0$. In Ireland, on the other hand, temperature was only a very little under the average.

In the north-west of Scotland the rainfall was considerably above the average, being generally a fifth more from Mull to Dunrobin, and nearly as much in the Pentland and neighbourhood. On the other hand, to the south of the Grampians, in the eastern and southern counties, with the exception of the Pentlands district and Wigtownshire, it was under the average, the greatest deficiency being a sixth under the average in the Border counties.

In every month except April the hours of sunshine were under the average of past years—most markedly so in May, June, July, and August, during which months—so important agriculturally—the hours of sunshine were 183 under the average.

JANUARY.—The mean temperature of the month was $41^{\circ}.0$, or $3^{\circ}.9$ greater than the mean, the days being $4^{\circ}.4$ and the nights $3^{\circ}.3$ warmer than usual in January. This excess was very evenly distributed over the country, except in the west, where temperatures were a little lower than in the east.

The rainfall was 5.80 inches, or 1.84 inch above the mean of the month. Except at the east coast stations, from Aberdeen to Berwick, and in Wigtownshire, and the extreme south of the counties of Argyll and Ayr, the rainfall was above the average. The deficiency in each of these districts was small; but the excess in the central districts near the Grampians, from Ballachulish to Grantown, was very great, the excess at Braemar being 171 per cent; at Fort Augustus, 150 per cent; at Dalnaspidal, 127 per cent; and at Dunkeld, 117 per cent. The high temperature and large rainfall of the month have their explanation in the high barometers in the south-east and low barometers in the north-west, and the great prevalence of south-westerly winds which necessarily resulted therefrom.

FEBRUARY.—The mean temperature was $37^{\circ}.8$, or half a degree under the mean, a deficiency wholly due to the colder nights. The distribution of temperature over the country was very unequal. From Islay to Buchanness temperature was the average; but to the north of that line it was higher, the greatest excess being $2^{\circ}.0$ in Shetland; whereas to the south it was lower than the average, the greater deficiency being about $2^{\circ}.0$ on the shores of the Solway and in the Border counties. Thus the extreme northern was relatively $4^{\circ}.0$ warmer than the southern counties.

The rainfall was 1.08 inch, or 2.01 inches less than the average, being thus only a third of the usual fall in February.

The deficiency was pretty evenly distributed over all districts, except in Orkney and Shetland, where it amounted only to a half of the average fall.

MARCH.—The mean temperature was $41^{\circ}.6$, or $2^{\circ}.2$ greater than the average, the days being $2^{\circ}.7$ and the nights $1^{\circ}.6$ warmer than usual. The excess of temperature was nearly equal in all parts of the country.

The rainfall was 3.38 inches, or 0.55 inch above the mean. To the north of a line drawn from the Mull of Kintyre to Aberdeen it was above the average, more than double the average being collected at Dunrobin, Glencarron, and Fort Augustus. On the other hand, to the south it was generally less than the average; the deficiency scarcely anywhere exceeded a fourth part. But over considerable tracts south of the Grampians more than the average rainfall was collected.

APRIL.—The mean temperature was $43^{\circ}.6$, or half a degree under the mean, the deficiency being wholly due to the greater cold of the nights, this being the only month of the year when the sunshine was above the mean. In the north and extreme west, temperature was about $1^{\circ}.0$ above the average; but in the counties of Berwick, Roxburgh, and the coast of the Solway, it was fully $1^{\circ}.0$ under the average.

The rainfall was 1.44 inch, or 0.82 inch under the average. It was a little above the average in the Lews and inland districts of the counties of Sutherland, Ross, and Inverness. Elsewhere the rainfall fell short of the average, the greatest deficiency being over the wide district from the Moray Firth to the Lammermoors, where at many places only one-fourth part of the April average was collected.

MAY.—The mean temperature was $51^{\circ}.0$, or $2^{\circ}.1$ greater than the average, the excess being nearly equally distributed between the days and the nights. Temperature was everywhere higher than usual, the greatest excess being in the west and north, rising in Shetland to nearly $4^{\circ}.0$; and the least excess in Berwickshire, where it was only about $1^{\circ}.0$.

The rainfall was 2.19 inches, or very nearly the average. Its distribution over the districts, however, was very unequal. In Orkney, most of Caithness, eastern districts from Kinnaird Head to the Firth of Tay, and over all the south-western counties, the rainfall was above the average, the excess amounting at only a few places to a half more than the average. Elsewhere it was under the mean, the greatest defect being in the west, where at several places less than half the usual May rainfall was collected.

JUNE.—The mean temperature was $53^{\circ}.9$, being nearly a degree under the mean, the deficiency being due to the colder days, which again the great deficiency of sunshine explains.

At coast stations from the Firth of Tay to the mouth of the Tweed, temperature was either or slightly above the average, but everywhere else it was under it. The deficiency was greatest in central districts, amounting in a good many places to a degree and a half.

The rainfall was 3.96 inches, or 1.48 inch above the average. Except a few scattered places from Tain to Fettercairn, where the rainfall scarcely reached the mean, it was in excess in other parts of the country. The least excess was in the east, and the greatest in the west, double the average having been collected at a number of places. At Benquhat the fall was 154 per cent above the mean of the month.

JULY.—The mean temperature was $54^{\circ}.7$, or $2^{\circ}.6$ less than the average, the deficiency being the same for the days and the nights. In all parts of the country temperature was low, the greatest deficiency, nearly $3^{\circ}.0$, being in south-western and central districts; and the least at northern and western stations, where in several districts it was little over a degree. The cloud exceeded the average, and the hours of sunshine were 56 fewer than the mean of July.

The rainfall was 3.79 inches, or 0.65 inch above the mean. The rainfall was under the average over rather a broad district in the east from the Don southward, and over the counties of Roxburgh and Dumfries, the deficiency being less than a third of the usual fall. In all other places the rainfall was above the average, the greatest excess—more than double the usual amount—being in Shetland and Orkney; and the fall was heavy in the counties of Caithness, Ross, Inverness, and the higher grounds of Ayr.

During the first fortnight of July all these characteristics were intensified; and, indeed, had this weather been prolonged over the whole month, the weather of July 1890 would have been one of the most disastrous on record. The following figures show the deficiency below the means of the temperature of these two weeks: Wick, $6^{\circ}.1$; Aberdeen, $5^{\circ}.1$; Leith, $4^{\circ}.8$; York, $5^{\circ}.0$; Cambridge, $6^{\circ}.4$; London, $7^{\circ}.8$; Isle of Wight, $5^{\circ}.7$; Jersey, $5^{\circ}.6$; Scilly, $5^{\circ}.6$; Parsonstown, $5^{\circ}.2$; and Cork, $4^{\circ}.4$. The distribution of the rainfall over the British Islands was unusually unequal. It was above the mean—in many places greatly above it—in the west and south of Ireland, in Scotland, and in the south-eastern, southern, and south-western counties of England. On the other hand, over the wide region bounded by the above, the rainfall was very deficient, less than half the average being collected in many places. During these two weeks winds were almost persistently northerly and north-westerly.

†. AUGUST.—The mean temperature was $55^{\circ}.2$, or $1^{\circ}.5$ less than

the mean, the deficiency being equally distributed between the days and nights. Again, as in July, the cold was relatively greatest in the southern counties, where in several places it was $2^{\circ}.0$, and least in the north and north-west, where it was only about half a degree. It will be noted that in this month southerly winds were 4 days less, and north-westerly winds 4 days more, than usual in August.

The rainfall was 3.90 inches, or 0.47 inch less than the average. Its distribution over the country was extremely irregular. It was above the average in the Lothians and Berwickshire, and all to the north of the Spey and Lochaber. But elsewhere it was under the average; it was also less than the average in Shetland, but the deficiency scarcely exceeded a third of the usual fall anywhere.

SEPTEMBER.—The mean temperature was $56^{\circ}.4$, or $3^{\circ}.7$ greater than the average. This was, generally, the finest summer month of the season, particularly the first part of the month; and it was the finest September we have had since 1865, which was the warmest September dating from 1764, when instrumental records of temperature began to be made in Scotland. The high temperature of September last was pretty evenly distributed over all districts, with the single difference that eastern districts were a degree warmer than western.

The rainfall was 3.84 inches, or 0.23 inch above the mean. This excess was wholly due to "heavy rainfall over rather wide districts" in the counties of Inverness, Argyll, Dumbar-ton, Ayr, and Lanark, the amount being above the average in per cents—88 at Fladda, 82 at Rhuvaa, and 78 at Benquhat, Ayrshire. In other districts the rainfall was under the average, the greatest deficiency being on the south of the Moray Firth inland, where at a number of places only about a sixth part of the usual September rainfall was recorded.

OCTOBER.—The mean temperature was $48^{\circ}.4$, or $1^{\circ}.8$ above the average, the excess being equally partitioned between the days and the nights. The greatest excess, upwards of two degrees, was in the counties south of the Grampians, and the least in north-west and north, falling, indeed, to the average in the north of Shetland.

The rainfall was 4.45 inches, or 0.46 inch above the mean. To the north of the Grampians and in the three Lothians the rainfall was above the average, the greatest excess being in the north-west, where at several places considerably more than double the mean rainfall of October was collected. At Glen-carron, Rosshire, there fell 23.11 inches, which is 144 per cent above its average. At the Ben Nevis Observatory the rainfall for October rose to 37.30 inches, being absolutely the highest hitherto recorded on any month at the top of Ben Nevis. In

other parts of the country the rainfall was under the average; over very considerable breadths only half the average of the month fell.

NOVEMBER.—The mean temperature was $41^{\circ}.0$, or $0^{\circ}.4$ above the average, the days being slightly warmer, relatively, than the nights. In southern, and more particularly south-eastern counties, temperature was fully half a degree under the average; it was the average about the line of the Grampians; whilst in the north-west and north it rose to upwards of two degrees above the average.

The rainfall was 6.77 inches, or 3.02 inches above the mean. The rainfall was least in the north and north-west, where temperatures were relatively highest; and most in excess over the southern half of Scotland, where temperatures were lowest, considerably more than double the average fall being recorded at many places. At Ardwell the amount was 180 per cent above the November mean.

DECEMBER.—The mean temperature was $35^{\circ}.2$, or $2^{\circ}.6$ under the average, the days being $3^{\circ}.5$ and the nights $2^{\circ}.0$ colder than usual. In Shetland, Orkney, and Caithness, temperatures were about half a degree above the mean of December; but everywhere else temperatures were under the average, the deficiency of temperature increasing regularly on advancing through the island southward and from the sea-coast inland. Hence the greatest cold was experienced in the south, the deficiency at Dumfries being $5^{\circ}.4$. The cold increased in intensity southwards through England, the lowest mean for the month being $11^{\circ}.0$. under the average of December at Oxford. This cold spread southward over Europe and into the north of Africa. It is explained by the high barometric pressures that generally ruled, stretching from Russia westward to Scotland, to the south of which pressure fell uninterruptedly as far at least as Algiers. This region was therefore swept by easterly and northerly winds, bearing with them the cold of higher latitudes, which increased still further in intensity as the winds passed over the frozen land-surfaces of the Continent. On the other hand, to the north of this high barometric pressure winds were southerly, as in Orkney and Shetland, and there, as has been seen, temperature was above the average. For a similar reason, at the head of the Gulf of Bothnia December was an unusually mild month, temperature being $7^{\circ}.0$ above the mean. This month shows in an impressive manner how intimately bound up is the weather of the British Islands with that of the continent of Europe.

The rainfall was 1.67 inch, or 2.36 inches less than the mean. In all parts of the country the rainfall was under the average, the greatest deficiency being in the west, and the least in the east from Buchanness to the Tweed, a difference occa-

sioned by the prevailing easterly winds. Over extensive tracts, at some distance from the east, scarcely one-seventh part of the average December rainfall was recorded.

The harvest of 1890 was from one to three weeks later than usual, the latest districts being generally in the more inland situations, and the earliest near the east coast and in the north.

Except in the southern counties the wheat crop was about an average. Barley was under the average in the south-west, but elsewhere it was a fairly good average, and in a number of districts in different parts of the country it was above the average. In all eastern districts south of the Dornoch Firth oats was a fine crop, in not a few districts the finest for some years; but in the south-west generally, the crop was an average only, and in several places fell short of it. The rains that set in after the equinox, did considerable damage to the grain crops, particularly in late and upland districts.

The potato crop was nearly everywhere very deficient, two-thirds or one-half an average crop only being obtained in a large number of districts. Disease was also more than usually prevalent, especially over the southern half of Scotland, one-half and in some cases three-fourths of the crop being destroyed.

The turnip crop from the Spey to the Lammermoors was greatly above the average, and generally of fine quality; but elsewhere the crop was generally less than the average, rising only in a very few districts to the average.

[TABLES

TABLE NO. 1.—ACREAGE UNDER EACH KIND OF CROP, BARE FALLOW, AND GRASS, IN EACH COUNTY OF SCOTLAND.
 AGRICULTURAL STATISTICS OF SCOTLAND.—RETURNED UPON 4TH JUNE 1890.—(Extracted from the Government Returns.)

COUNTIES.	CORN CROPS.				GREEN CROPS.										Permanent Pasture (excl. Moun- tain)	Flax.	Small Fruit.	Bare Fallow or Uncropped Land.	
	Wheat.	Barley or Malt.	Oats.	Rye.	Beans.	Pears.	Total.	Potatoes.	Turnips.	Mangel.	Carrots.	(Cabbage, Kohlrabi, and Rape.)	Other Green Crops.	Total.					Grasses under Rotation.
1. Aberdeen . . .	2	16,538	197,340	348	297	362	213,987	7,408	90,979	4	56	75	2,721	101,243	208,058	30,200	200	341	543
2. Argyll . . .	..	1,907	18,987	484	128	15	21,486	5,560	5,471	43	38	142	33	11,282	27,328	72,389	15	15	548
3. Argyll . . .	2,444	1,507	47,146	423	824	19	52,403	8,057	7,570	337	316	545	89	17,114	138,511	111,384	119	119	295
4. Banff . . .	130	8,569	54,143	166	155	73	63,238	2,417	24,387	5	5	1,047	1,047	26,368	68,618	11,000	26	26	312
5. Berwick . . .	3,455	19,249	57,769	33	1,089	136	79,729	2,963	28,432	79	2	799	824	32,400	61,938	44,321	20	20	162
6. Bute . . .	..	53	5,923	46	63	9	5,406	1,001	1,434	3	4	79	27	2,434	7,961	7,961	38	38	134
7. Caithness . . .	2	1,193	35,682	111	10	21	36,410	1,878	14,323	..	..	79	484	16,764	30,505	25,231	2	2	161
8. Clackmannan . . .	421	534	3,258	..	616	..	4,829	3,327	811	4	..	90	47	1,219	4,459	5,102	14	14	234
9. Dunbarton . . .	1,007	196	6,524	16	171	10	8,226	2,204	1,504	20	6	186	74	3,994	18,341	17,632	60	60	114
10. Dumfries . . .	75	638	47,744	44	31	6	48,537	5,073	11,934	14	42	704	100	25,978	78,306	98,145	52	52	130
11. Edinburgh . . .	4,249	6,666	23,111	1	259	81	34,367	5,073	11,934	16	34	704	1,018	18,779	37,266	48,928	240	240	154
12. Elgin . . .	2,167	13,282	22,545	961	64	15	39,634	1,898	16,435	14	14	125	988	18,786	39,257	5,465	59	59	137
13. Fife . . .	39,380	39,380	1,517	1,510	50	76,999	15,188	26,334	13	14	245	125	866	49,548	85,798	20,296	10	88	1,409
14. Forfar . . .	253,756	11,321	23,265	983	748	37	89,817	14,396	34,088	28	150	346	378	24,068	30,175	28,928	402	276	830
15. Haddington . . .	9,273	27,485	61,291	69	1,230	70	40,506	7,155	15,979	28	130	346	378	24,068	30,175	28,928	98	830	1,409
16. Inverness . . .	7,260	15,067	81,232	823	1	34	39,777	6,914	11,501	1	33	130	346	24,068	30,175	28,928	107	148	6
17. Kincardine . . .	686	10,381	31,697	61	582	38	43,465	3,003	17,850	..	33	130	346	24,068	30,175	28,928	25	139	6
18. Kinross . . .	22,278	29	5,412	35	7	..	5,624	584	2,405	..	4	505	54	17,395	68,289	17,644	95	139	6
19. Kirkcubright . . .	83	65	28,815	40	162	2	29,107	1,947	13,840	32	37	1,505	64	11,308	68,289	17,644	95	139	6
20. Lanark . . .	2,518	280	38,726	70	996	23	42,563	4,992	9,025	22	75	1,629	269	10,403	115,783	81,741	1,721	494	494
21. Linlithgow . . .	1,134	3,039	9,641	14	486	8	14,842	1,545	3,923	5	3	99	263	5,838	20,086	18,678	21	299	299
22. Nairn . . .	25,263	2,917	6,807	310	..	7	9,052	381	4,218	1	..	7	47	4,648	9,487	2,054	..	4	38
23. Orkney . . .	..	5,177	33,299	..	5	47	38,498	3,008	14,249	1	..	59	300	17,624	33,004	20,400	5	869	869
24. Shetland . . .	..	2,088	7,444	..	..	..	9,532	3,246	1,305	..	..	47	2	5,028	1,085	45,094	..	6	41
25. Peebles . . .	19	671	8,289	6	1	2	8,988	523	4,429	..	..	437	111	5,895	13,372	14,824	..	579	2,130
26. Perth . . .	7,293	15,483	68,526	694	2,785	45	94,826	14,755	30,325	47	11	217	110	45,905	118,683	87,735	70	103	103
27. Renfrew . . .	96,247	91	12,987	14	495	4	15,373	3,216	2,310	26	19	387	107	6,015	20,501	44,986	..	14	469
28. Ross & Cromarty . . .	1,946	12,279	30,899	831	9	48	46,082	9,076	16,586	12	2	18	632	20,326	41,462	55,000	59	32	32
29. Roxburgh . . .	846	13,408	31,573	87	268	39	46,219	1,532	23,492	45	3	692	361	26,575	7,657	9,291	..	12	9
30. Selkirk . . .	24,269	8	4,204	41	..	81	4,495	221	2,457	..	..	..	262	2,982	7,420	36,531	6	107	1,690
31. Stirling . . .	2,293	3,620	18,468	27	2,962	14	27,324	3,518	4,435	9	4	172	296	8,434	9,089	45,106	..	6	843
32. Sutherland . . .	3,078	1,787	7,768	90	1	25	9,767	1,787	3,002	..	..	..	32	4,831	8,043	8,043	..	6	843
33. Wigtown . . .	1,129	1,986	34,326	56	252	4	36,693	1,855	15,841	128	101	258	146	18,392	71,036	27,067	..	18	901
Total . . .	61,973	215,792	1,013,646	8,453	16,086	1,263	1,317,213	141,528	482,290	1,146	1,020	10,352	13,438	649,774	1,686,290	1,925,053	38	4,404	13,238

TABLE No. 2.—ESTIMATED TOTAL PRODUCTION OF WHEAT, BARLEY, AND OATS IN 1890, ACREAGE UNDER THESE CROPS, ESTIMATED AVERAGE YIELD PER ACRE, AND ESTIMATED YIELD PER ACRE ABOVE OR BELOW AN ORDINARY AVERAGE CROP, IN EACH OF THE COUNTIES OF SCOTLAND.

COUNTIES.	WHEAT.				BARLEY, INCLUDING BERE.				OATS.								
	Total Produce in 1890.	Acres in 1890.	Average Yield per Acre.			Total Produce in 1890.	Acres in 1890.	Average Yield per Acre.			Total Produce in 1890.	Acres in 1890.					
			Ordinary.	1889.	Average.			Ordinary.	1889.	Average.							
Aberdeen	Bush. 64	2	32.00	Bush. 30.32	Bush. 33.72	Bush. 24.00	Bush. 547,386	15,538	Bush. 33.23	Bush. 32.41	Bush. 32.62	Bush. 7,688,721	197,340	Bush. 38.96	Bush. 33.05	Bush. 33.78	Bush. 81.54
Argyle	..	..	..	..	..	..	51,105	1,907	36.80	37.52	29.30	505,295	18,067	20.80	32.96	30.68	31.26
Ayr	97,917	2,544	38.49	31.59	42.04	35.70	56,513	1,537	36.77	40.34	37.83	38.62	47,146	47.03	46.29	46.33	45.64
Banff	4,239	130	33.38	33.77	34.59	31.15	324,958	8,569	37.92	35.43	34.88	30.91	54,143	37.86	32.70	34.40	28.72
Barwick	123,120	3,455	35.64	30.34	32.63	28.45	715,688	19,240	37.19	36.32	34.90	35.82	37,669	42.32	39.56	40.49	41.71
Bute	..	..	..	..	..	..	2,212	55	40.22	34.11	43.37	41.68	5,233	39.81	31.12	43.85	41.61
Caithness	32	2	16.00	21.14	26.00	21.00	44,744	1,193	37.51	29.96	34.45	23.92	35,082	37.69	30.73	34.70	26.47
Clackmannan	15,432	421	36.66	30.85	37.34	33.39	18,408	534	34.47	33.50	36.00	33.38	3,258	45.60	33.74	43.58	40.09
Dumfries	40,484	1,007	40.20	30.72	42.68	36.74	7,753	196	38.56	33.21	33.45	33.26	6,824	40.71	35.66	40.03	36.13
Dumfries	2,594	75	34.59	33.56	34.81	28.57	24,313	658	36.95	36.16	36.88	32.29	47,744	36.77	35.76	38.70	33.60
Edinburgh	176,154	4,249	41.46	36.71	41.53	34.60	287,303	6,660	43.10	30.60	42.64	40.37	23,111	41.36	39.75	40.37	40.01
Elgin or Moray	66,845	2,167	30.85	30.99	33.25	28.15	461,946	13,282	34.78	33.48	29.18	33.83	814,578	40.08	35.09	30.62	33.53
Fife	379,332	11,321	33.51	30.16	34.85	29.75	822,188	23,295	40.73	34.00	36.33	33.52	51,291	50.27	40.70	45.72	43.52
Forfar	313,719	9,273	33.83	33.45	32.52	27.57	1,119,496	27,485	42.63	35.26	37.74	33.77	2,578,284	46.07	44.44	42.89	45.42
Glasgow	280,340	7,260	38.61	35.16	39.51	32.20	643,205	15,087	36.14	30.95	30.50	41.37	16,790	33.48	29.81	28.56	28.17
Haddington	2,557	68	37.60	26.00	32.00	30.00	27,718	7,629	35.67	32.16	34.02	32.55	31,697	40.19	35.86	39.39	35.67
Inverness	26,481	686	38.60	34.12	34.82	32.47	370,288	10,381	35.67	29.82	40.62	37.95	5,412	39.85	32.13	39.76	34.75
Kilcannord	856	29	29.52	28.85	28.00	26.18	17,057	441	38.68	31.92	31.35	30.92	215,674	36.58	34.23	35.40	35.88
Kirkcudbright	2,325	83	28.01	33.31	29.34	25.87	2,069	65	32.29	34.21	40.97	33.03	28,815	44.67	42.13	42.27	42.04
Lennox	94,366	2,518	37.48	35.93	39.89	35.11	8,336	230	36.24	34.21	41.80	42.10	35,728	37.58	37.85	38.52	38.58
Linlithgow	42,563	1,134	37.53	34.71	37.27	31.65	130,671	3,059	42.72	42.65	41.80	42.43	9,641	46.72	42.32	42.27	42.04
Nairn	318	11	28.91	..	26.37	25.88	107,270	2,917	36.77	34.81	29.42	32.43	5,807	36.25	35.25	39.50	37.92
Orkney	..	..	..	..	..	..	187,893	5,177	36.29	36.13	25.18	27.86	928,468	27.91	34.42	26.36	23.70
Peebles	608	19	32.00	..	30.00	27.40	23,128	671	34.47	31.28	33.72	32.84	8,289	35.77	34.02	34.43	33.16
Perth	228,459	7,293	31.83	33.80	40.27	32.70	540,679	15,483	31.92	34.13	37.05	33.10	12,987	36.85	36.30	36.71	34.15
Renfrew	79,638	1,962	40.18	33.64	47.75	38.61	4,093	91	44.98	37.97	43.87	32.20	12,987	45.67	42.09	41.80	42.45
Ross and Cromarty	76,017	1,966	38.67	34.34	31.50	32.19	469,287	12,279	38.22	31.95	32.28	32.03	30,899	38.46	36.17	32.04	32.47
Roxburgh	30,876	846	36.50	30.77	33.26	29.79	498,593	13,408	37.19	35.51	35.04	35.82	31,573	39.02	37.02	39.24	37.00
Selkirk	240	8	30.00	26.00	24.00	20.00	1,494	254	32.03	29.11	31.00	31.92	4,204	34.54	29.67	34.36	31.49
Shetland	..	..	..	..	..	..	63,547	2,068	30.43	29.47	24.66	20.83	7,444	28.29	20.29	16.23	10.35
Stirling	88,675	2,293	36.49	30.17	34.43	28.06	134,455	3,620	37.14	31.32	36.15	34.15	18,468	40.20	31.95	39.53	34.79
Southland	36	2	18.00	..	..	..	63,398	1,881	33.70	30.33	27.11	29.98	294,489	37.90	36.66	30.59	32.21
Wigtown	30,139	1,129	26.70	30.11	32.15	30.91	82,96	926	32.96	30.37	31.51	31.17	34,326	46.61	36.42	36.13	38.32
Total	2,193,526	61,973	37.49	..	..	..	8,061,642	215,792	37.36	..	..	..	39,967,048	39.43	..	..	..

* As computed from Returns furnished by Estimators in 1888.

TABLE No. 3.—ESTIMATED TOTAL PRODUCTION OF BEANS, PEAS, AND POTATOES IN THE YEAR 1890, ACRES UNDER THESE CROPS, ESTIMATED AVERAGE YIELD PER ACRE, AND ESTIMATED YIELD PER ACRE ABOVE OR BELOW AN ORDINARY AVERAGE CROP, IN EACH OF THE COUNTIES OF SCOTLAND.

COUNTIES	BEANS.					PEAS.					POTATOES.				
	Total Produce in 1890.			Average Yield per Acre.		Total Produce in 1890.	Average Yield per Acre.		Total Produce in 1890.	Average Yield per Acre.		Total Produce in 1890.	Average Yield per Acre.		
	Bush.	Acres.	Tons.	Ordinary.	Bush.		Acres.	Tons.		Ordinary.	Bush.		Acres.	Tons.	Ordinary.
						1890.			1889.			1888.			
Aberdeen	7,773	297	26.17	28.26	17.97	8,697	362	24.02	23.27	23.41	14,669	18,345	3.40	3.42	3.43
Argyle	2,680	123	21.79	24.52	22.52	1,003	5	20.60	37.62	20.86	24.00	39,560	5.32	5.47	4.71
Ayr	24,732	824	30.01	34.47	29.12	549	19	28.89	34.96	49.83	33.50	37,552	7.03	6.82	5.03
Banff	4,566	155	29.46	31.56	22.13	1,729	58	23.05	23.02	17.68	11,238	2,417	4.66	4.62	3.79
Berwick	36,262	1,089	33.30	33.91	26.78	3,642	186	28.78	24.75	26.26	19.14	11,238	5.08	5.92	4.77
Bute	1,727	63	27.41	30.96	28.19	196	9	21.77	27.83	22.39	19.00	6,254	6.24	6.07	4.60
Caithness	160	10	16.00	—	—	294	21	14.00	—	—	—	7,552	4.18	5.52	6.71
Clackmannan	30,990	616	34.07	26.97	38.80	224	10	21.10	27.24	23.53	24.67	11,081	6.70	8.50	6.36
Dumfries	5,026	171	29.39	27.74	26.37	127	5	25.40	33.73	23.00	24.40	17,759	8.36	7.07	5.86
Dumfries	915	31	29.52	29.97	26.37	2,044	81	25.23	27.51	22.70	20.82	28,439	5.61	5.89	7.47
Edinburgh	8,534	250	32.95	35.58	26.56	2,993	15	19.53	22.06	16.89	15,988	4,001	3.99	4.91	4.06
Elgin or Moray	1,643	64	25.67	31.93	27.34	1,677	293	33.54	30.12	30.08	25.91	70,075	4.61	4.55	3.78
Fife	53,720	1,516	38.73	34.45	27.37	1,677	50	33.54	30.12	30.08	25.91	70,075	4.61	4.55	3.78
Forfar	24,532	748	32.80	33.85	27.52	1,033	37	27.92	25.97	28.00	20.00	41,472	4.90	5.74	4.63
Glasgow	40,565	1,230	32.98	33.54	31.42	1,760	70	25.14	25.89	23.68	21.09	41,472	4.90	5.74	4.63
Inverness	23	1	23.00	35.50	20.00	24.33	34	26.53	27.31	26.73	26.75	28,503	4.12	4.90	5.68
Kincardine	21,221	582	36.46	31.33	36.71	1,620	58	27.93	24.00	31.11	14.46	16,932	5.03	5.68	4.60
Kinross	210	7	30.00	23.00	30.00	54	2	27.00	31.00	34.50	30.00	3,238	4.74	6.02	3.96
Kirkcubright	3,565	102	34.95	31.26	34.22	694	23	30.17	26.00	23.19	21.52	18,119	4.92	6.10	7.14
Leamington	33,644	956	33.68	33.60	34.39	2,732	81	34.75	—	—	19.47	7,930	6.52	8.22	5.17
Linlithgow	16,958	486	32.84	34.07	31.29	198	8	20.86	12.44	17.33	19.37	1,545	4.95	6.44	4.80
Nairn	—	—	—	28.00	—	146	—	—	—	—	—	881	5.67	5.67	4.64
Orkney	—	—	—	—	—	—	—	—	—	—	—	3,008	5.41	6.98	5.27
Peebles	26	1	26.00	30.00	35.00	37	2	18.50	27.39	23.76	19.60	2,168	4.15	5.82	7.47
Perth	88,289	2,785	31.70	28.12	20.00	1,359	45	30.20	24.76	27.47	18.08	82,322	5.56	6.07	4.95
Renfrew	20,288	495	40.99	40.15	41.77	1,412	4	35.50	36.00	42.20	38.02	12,683	7.24	8.79	6.10
Ross and Cromarty	251	9	27.89	23.42	25.40	1,241	48	25.58	21.71	23.36	23.71	45,000	6.88	6.88	4.10
Roxburgh	8,213	266	30.88	33.03	32.94	1,021	39	26.18	24.96	23.39	15.59	15,932	4.37	5.78	4.86
Selkirk	—	—	—	—	—	—	8	25.00	24.00	25.00	14.51	3,001	3.00	5.13	6.03
Shetland	—	—	—	—	—	—	—	—	—	—	—	11,108	3.42	6.16	6.57
Stirling	98,378	2,902	33.90	28.96	33.94	349	14	24.93	22.04	37.56	18.79	16,104	4.56	5.60	6.13
Sutherland	36	1	36.00	—	16.00	543	25	21.80	—	19.42	21.63	7,767	7.27	4.77	4.42
Wigtown	7,116	252	28.24	27.96	26.71	126	4	31.50	26.33	30.00	31.09	6,847	4.29	5.00	4.88
Total	535,933	16,081	33.83	—	—	30,989	1,216	25.48	—	—	—	676,230	4.78	6.98	4.42

* As computed from Returns furnished by Estimators in 1885.

† The produce of 47 acres was picked green.

TABLE No. 4.—ESTIMATED TOTAL PRODUCTION OF TURNIPS AND MANGELS in the Year 1890, ACREAGE under these CROPS, Estimated Average Yield per Acre, and Estimated Yield per Acre ABOVE or BELOW an Ordinary Average Crop, in each of the COUNTIES of SCOTLAND.

COUNTIES.	TURNIPS.					MANGELS.						
	Total Produce in 1890.	Acres in 1890.	Average Yield per Acre.			Total Produce in 1890.	Acres in 1890.	Average Yield per Acre.				
			1890.	Ordinary Average.*	1889.			1888.	1890.	Ordinary Average.*	1889.	1888.
Aberdeen	Tons. 1,408,728	Acres. 90,979	Tons. 15.43	Tons. 15.47	Tons. 13.51	Tons. 55	4	Tons. 13.75	Tons. 14.00	Tons. 10.00		
Argyle	91,669	5,471	16.76	15.23	16.33	609	43	14.16	15.49	13.43		
Ayr	105,963	7,570	14.00	16.61	18.85	6,865	537	12.78	16.32	13.82		
Banff	391,371	24,887	15.72	14.58	15.30	88	5	17.60	18.67	18.00		
Berwick	509,342	28,433	17.91	17.06	17.52	1,738	79	22.00	21.02	12.93		
Bute	28,239	1,434	19.69	10.55	17.88	43	3	14.33	15.50	12.14		
Caithness	188,608	14,323	13.16	15.83	17.32	..	..	..	..	..		
Caithness	9,075	811	11.19	14.54	10.52	53	4	13.25	10.50	14.75		
Clackmannan	23,529	1,504	15.64	10.96	15.65	267	20	13.35	7.11	13.89		
Dumfries	320,854	20,452	15.69	17.13	19.13	1,089	44	23.61	24.33	16.83		
Edinburgh	219,233	11,934	18.37	14.92	18.86	177	16	11.06	16.00	10.31		
Elgin or Moray	283,810	16,435	17.27	15.94	16.76	252	14	16.57	19.89	20.17		
Fife	338,748	26,334	12.86	13.44	13.41	130	13	9.23	10.00	11.33		
Forfar	631,701	34,098	18.53	17.41	18.39	130	7	18.57	17.13	18.44		
Haddington	314,233	15,979	19.67	17.49	19.61	324	28	11.57	15.31	13.17		
Inverness	146,982	11,501	12.78	14.82	14.09	21	1	21.00	23.50	23.50		
Kincardine	295,933	17,850	16.58	14.37	14.77	..	..	..	..	..		
Kinross	29,961	2,405	12.46	13.54	12.50	..	..	..	..	..		
Kirkcudbright	215,200	13,840	15.55	17.92	18.15	449	32	14.03	20.76	14.75		
Leask	166,779	9,025	18.48	17.07	21.54	285	22	12.95	13.06	11.90		
Linkithgow	64,341	3,923	16.40	15.29	16.66	53	5	10.60	11.00	9.29		
Nairn	59,550	4,218	14.12	14.41	14.96	16	1	16.00	18.00	..		
Orkney	180,601	14,249	12.67	16.81	11.21	..	..	4.00	..	..		
Peebles	78,019	4,429	16.49	16.16	17.69	..	..	..	..	..		
Perth	456,371	30,325	15.05	16.78	15.04	634	47	13.49	12.00	11.59		
Renfrew	35,038	2,310	15.17	17.67	17.51	377	26	14.50	15.07	13.68		
Ross and Cromarty	205,456	16,586	12.39	14.91	13.80	304	13	25.33	24.18	23.80		
Roxburgh	416,113	23,942	17.38	16.23	18.77	1,010	45	22.44	23.91	17.67		
Selkirk	40,383	2,457	16.42	15.93	16.71	..	..	..	..	..		
Shetland	21,625	1,305	16.57	13.75	16.45	..	..	..	..	..		
Stirling	72,215	4,435	16.28	14.55	13.84	116	9	12.99	11.33	10.63		
Sutherland	37,055	3,002	12.34	17.30	15.16	..	..	..	..	..		
Wigtown	204,378	15,844	12.90	19.91	16.88	1,687	128	13.18	22.73	18.98		
Total	7,680,899	482,290	15.72	..	..	16,698	1,146	14.57	..	..		

* As computed from Returns furnished by Estimators in 1885.

TABLE NO. 5.—ESTIMATED TOTAL PRODUCTION OF HAY FROM CLOVER, SAINFOIN, AND GRASSES UNDER ROTATION, ALSO TOTAL FROM PERMANENT PASTURE, IN THE YEAR 1890. ACREAGE UNDER THAT CROP, ESTIMATED AVERAGE YIELD PER ACRE, AND ESTIMATED YIELD PER ACRE ABOVE OR BELOW AN ORDINARY AVERAGE CROP, IN EACH OF THE COUNTIES OF SCOTLAND.

COUNTIES.	FROM CLOVER, SAINFOIN, AND GRASSES.						FROM PERMANENT PASTURE.					
	Average Yield per Acre.			Average Yield per Acre.			Average Yield per Acre.			Average Yield per Acre.		
	Total Produce in 1890.	Acres in 1890.	Ordinary Average.	1889.	1888.	Tons.	Total Produce in 1890.	Acres in 1890.	Ordinary Average.	1889.	1888.	Tons.
Aberdeen	74,882	51,151	1.46	1.95	1.36	3,216	3,063	1.05	1.13	0.95	0.91	0.91
Argyle	21,195	11,939	1.78	1.54	1.42	30,314	13,309	1.83	1.33	1.49	1.43	1.43
Ayr	61,606	33,182	1.86	1.77	1.40	35,748	17,985	1.99	1.75	1.93	2.16	1.93
Bangor	21,998	14,946	1.47	1.42	1.31	1,217	1,219	1.00	0.99	1.00	1.03	1.03
Berwick	17,893	9,493	1.88	1.97	2.04	4,488	2,611	1.72	1.75	1.64	1.61	1.61
Bute	5,054	2,527	2.00	1.67	1.98	541	893	1.65	1.72	1.50	1.92	1.92
Caithness	26,843	11,361	1.63	1.63	1.13	6,096	3,365	1.81	—	1.09	0.75	0.75
Clackmannan	2,925	1,819	1.55	1.96	2.52	683	456	1.50	1.19	1.46	1.77	1.77
Dumfries	12,499	6,915	1.70	1.70	1.72	2,761	1,692	1.63	1.34	1.46	1.67	1.67
Dumfries	15,806	15,806	1.55	1.75	1.43	31,557	17,454	1.81	2.05	1.72	1.56	1.56
Edinburgh	24,064	12,199	1.97	1.88	2.03	4,194	2,556	1.64	1.71	1.80	1.47	1.47
Edinburgh or Moray	9,882	8,297	1.19	1.44	1.12	587	655	0.90	1.00	0.71	0.92	0.92
Fife	46,135	26,881	1.72	1.57	1.99	11,399	7,663	1.41	1.41	1.59	1.46	1.46
Forfar	34,762	21,469	1.62	1.64	1.75	4,595	3,676	1.25	1.07	1.25	2.00	2.00
Glasgow	18,332	9,416	1.95	1.89	2.27	2,631	1,732	1.63	1.63	1.85	1.58	1.58
Inverness	11,978	12,858	1.93	1.09	0.92	2,601	4,510	0.58	0.66	0.70	0.59	0.59
Kincardine	22,128	14,283	1.55	1.37	1.42	1,484	1,002	2.10	0.80	1.00	0.97	0.97
Kirkcubright	3,400	1,942	1.75	1.59	1.74	2,108	1,438	1.43	1.43	1.48	1.74	1.74
Kirkcubright	13,290	8,300	1.59	1.42	1.52	17,704	10,850	1.63	1.48	2.03	1.40	1.40
Leithgow	58,547	30,821	1.90	1.56	1.87	23,748	12,799	2.01	1.69	2.18	2.10	2.10
Linlithgow	12,438	6,762	1.84	1.75	2.07	1,894	1,174	1.61	1.83	1.82	1.55	1.55
Nairn	3,111	3,316	1.40	1.40	1.05	825	433	0.72	1.00	0.84	0.30	0.30
Orkney	24,842	13,576	1.83	1.69	0.61	533	2,665	0.20	1.02	0.53	0.80	0.80
Peebles	3,478	2,260	1.54	1.56	1.52	3,034	2,168	1.40	1.71	1.47	1.26	1.26
Perth	52,589	32,669	1.61	1.69	1.77	15,674	12,183	1.29	1.06	1.29	1.37	1.37
Renfrew	27,841	14,048	1.98	1.68	2.04	13,529	5,940	2.11	2.29	1.80	2.43	2.43
Ross and Cromarty	14,794	14,551	1.02	1.40	1.03	1,782	3,058	0.58	0.72	0.59	0.59	0.59
Roxburgh	16,697	9,437	1.76	1.89	1.59	11,479	7,028	1.63	1.82	1.49	1.82	1.82
Selkirk	2,190	1,117	1.96	1.89	1.49	3,134	1,385	2.26	1.52	1.42	1.87	1.87
Shetland	1,887	624	2.22	2.00	1.85	1,687	1,419	1.19	1.00	0.50	0.50	0.50
Stirling	20,646	13,259	1.56	1.62	1.50	7,939	4,837	1.52	0.98	1.32	1.37	1.37
Sutherland	4,167	9,856	1.08	1.00	0.84	1,202	1,325	0.91	0.46	0.57	0.85	0.85
Wigtown	10,921	5,073	2.15	1.91	2.25	4,955	2,964	1.67	1.64	1.61	1.76	1.76
Total	706,704	426,162	1.66	..	..	245,234	154,944	1.58	..	..	..	..

* As computed from Returns furnished by Estimators in 1886. † Exclusive of heath and mountain land.

TABLE NO. 7.—QUANTITIES AND VALUES OF THE IMPORTS OF LIVE CATTLE, SHEEP, AND SWINE, 1888 AND 1889.

	QUANTITIES.		VALUES.	
	1888.	1889.	1888.	1889.
	No.	No.	£	£
Live cattle	377,068	555,222	5,912,361	9,069,327
Live sheep	956,210	677,958	1,745,549	1,185,132
Live pigs	24,509	25,324	74,784	93,373
Total	1,357,807	1,258,504	7,727,094	10,350,832

TABLE NO. 8.—QUANTITIES AND VALUES OF THE IMPORTS OF BEEF, MUTTON, PORK, BACON, HAMS, FISH, EGGS, BUTTER, &c., 1888 AND 1889.

	QUANTITIES.		VALUES.	
	1888.	1889.	1888.	1889.
	Cwts.	Cwts.	£	£
Meat—				
Beef, fresh	836,659	1,385,752	1,919,306	3,029,154
Beef, salted	226,943	262,468	349,634	366,778
Mutton, fresh	988,010	1,225,058	1,939,475	2,575,396
Unenumerated, salted or fresh	56,998	82,862	121,074	177,678
Unenumerated, preserved other than by salting	542,318	641,705	1,376,879	1,634,223
Pork, salted and fresh	489,353	386,700	920,125	678,922
Bacon	3,594,212	3,603,284	8,943,387	7,286,459
Hams		980,844		2,508,833
Total	6,734,493	8,468,653	14,969,880	18,257,443
Fish	1,907,644	1,988,029	2,324,365	2,588,623
Rabbits	99,800	123,874	276,612	341,733
Poultry and game (see value)	..	..	403,537	473,193
Butter	1,671,433	1,927,842	8,913,045	10,244,636
Margarine	1,139,743	1,241,690	3,268,313	3,655,061
Cheese	1,917,616	1,907,999	4,545,408	4,490,970
Lard	885,036	1,192,654	1,819,133	2,176,332
Eggs	1,126,793	1,151,900	3,083,167	3,127,590
Total	..	..	24,634,580	27,098,138

TABLE NO. 9.—QUANTITIES AND VALUES OF THE IMPORTS OF WHEAT AND WHEAT-FLOUR, 1888 AND 1889.

	QUANTITIES.		VALUES.	
	1888.	1889.	1888.	1889.
	Cwts.	Cwts.	£	£
Wheat	57,261,363	58,551,887	21,995,974	22,510,502
Wheat-flour	16,910,442	14,672,082	9,530,746	8,543,906
Total	74,171,805	73,223,969	31,526,720	31,054,410

TABLE NO. 10.—QUANTITIES AND VALUES OF THE IMPORTS OF BARLEY, OATS, INDIAN CORN, RYE, MEAL, &c., 1888 AND 1889.

	QUANTITIES.		VALUES.	
	1888.	1889.	1888.	1889.
	Cwts.	Cwts.	£	£
Barley	21,305,350	17,400,910	6,070,063	4,964,739
Oats	19,770,680	15,980,567	4,596,006	4,470,420
Maize	25,370,164	36,192,325	6,888,615	8,580,522
Pean	5,448,354	1,895,179	1,630,058	556,120
Beans		3,579,579		1,121,567
Rye	1,382,267	595,001	324,485	174,522
Buckwheat	101,543	129,646	28,504	36,906
Total	72,328,364	75,583,207	19,536,961	19,904,626
Oatmeal	57,145	262,068	29,887	137,835
Maize-meal	14,745	20,118	8,001	18,116
Barley-meal	589,048	250,367	152,027	70,664
Rye-meal				
Pee-meal and bean-meal				
Buckwheat-meal				
Other meals	660,936	532,593	189,915	226,615
Total				

TABLE NO. 11.—AVERAGE PRICES PER HEAD OF VARIOUS KINDS OF ANIMALS, DEAD MEAT, AND PROVISIONS IMPORTED INTO THE UNITED KINGDOM IN 1888 AND 1889.

Kind of Animals, Dead Meat, &c.	1888.	1889.
Animals—Horses each	£16 14 10	£20 1 0
" Oxen and bulls from all countries "	17 17 2	18 8 2
" Sheep, including lambs, from all countries "	1 16 4	1 15 3
" Pigs "	3 1 0	3 15 3
Bacon—From all countries per cwt.	2 4 9	2 1 7
Hams—From all countries "	2 12 10	2 11 1
Beef, salted—From all countries "	1 10 9	1 7 11
" fresh—From all countries "	2 5 10	2 3 8
Pork, salted—From all countries "	1 9 4	1 9 0
" fresh—From all countries "	2 5 10	2 8 11
Butter—From all countries "	5 6 7	5 6 3
Margarine "	2 17 4	2 18 10
Cheese—From all countries "	2 7 5	2 7 0
Potatoes—From all countries "	0 6 8	0 7 10
Eggs—From all countries per 120	0 6 6	0 6 7
Lard—From all countries per cwt.	2 1 1	1 16 5

TABLE NO. 12.—RETURN OF THE AVERAGE PRICES OF WOOL IN THE YEARS 1888 AND 1889.

Years.	Australian.	South African.	English Fleeces.
	Per lb.	Per lb.	Per lb.
	s. d.	s. d.	s. d.
1888	0 10½	0 9½	0 9½ to 0 11½
1889	0 10½	0 10½	0 9½ " 1 0½

[HIGHEST,

HIGHEST, LOWEST, AND AVERAGE PRICES (PER IMPERIAL QUARTER) OF HOME-GROWN WHEAT, BARLEY, OATS, AND BEANS IN THE WEEKLY MARKET OF EDINBURGH FOR THE YEAR 1890.

Note as to the Former and Present Method of Striking the Average Price.

Whereas, previous to the month of April 1890, the average prices were struck over what was called "Stock in Market," and which included grain brought in bulk to the market on farmers' carts, and also grain lying at the various railway stations in town, 4-bushel sample bags of which were brought to the market; they excluded grain shown by 4-bushel sample-bags, and also hand samples exhibited on stools, as representative of stock lying outside at various places, these samples being considered as outside the term "Stock in Market."

This principle of striking the average frequently excluded a large portion of the grain sold in the market, and not unfrequently caused the absence of an average price—see Wheat, 26th March 1890—notwithstanding the fact that sales had taken place, and often, to a large extent, all arising from the fact that these sales were made from samples considered as excluded from "Stock in Market."

From the 1st of April 1890 the party offering home-grown grain can do so by 4-bushel sample-bag, or hand sample exhibited on stool, but in every case he must intimate to the market clerk the quantity he intends to offer for sale. He must, likewise, report the quantity he has sold, and at what price, so that the average is now struck over all the sales—thus we have a correct account of the quantity offered for sale, of the quantity sold, and also a correct average price.

WHEAT.

Date.	Highest Price.	Lowest Price.	Average Price.	Date.	Highest Price.	Lowest Price.	Average Price.
1890				1890			
Jan.	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	July	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
8	32 0	26 0	29 3	30	36 6	31 0	35 1
15	31 6	25 0	27 9	Aug.			
22	32 0	27 6	29 0	6	39 0	31 0	35 9
29	30 0	26 0	28 9	13	38 6	30 0	36 9
Feb.				20	37 6	31 0	35 2
5	33 0	28 6	28 6	27	39 0	32 6	36 10
12	31 6	26 0	30 0	Sept.			
19	32 9	26 0	27 9	3	37 9	33 0	36 0
26	32 0	25 0	30 10	10	37 0	33 6	36 8
March				17	36 6	26 0	34 10
5	33 0	23 0	30 10	24	37 0	30 6	33 8
12	33 0	23 0	30 0	Oct.			
19	32 0	27 0	31 5	1	38 6	28 0	34 11
26	32 9	27 0	..	8	39 0	27 6	33 5
April				15	38 0	29 0	33 6
2	33 0	26 6	31 1	22	39 0	22 0	33 1
9	33 0	28 6	31 4	29	38 6	26 0	32 11
16	32 6	24 0	30 7	Nov.			
23	33 6	26 0	32 0	5	37 6	27 0	32 11
30	33 6	27 0	31 8	12	38 0	28 0	33 1
May				19	34 0	20 6	31 11
7	34 0	24 0	32 7	26	35 0	24 0	31 9
14	34 6	29 0	31 7	Dec.			
21	33 6	25 6	31 7	3	34 0	27 6	31 8
28	33 6	22 0	31 8	10	34 0	29 0	32 7
June				17	35 0	29 0	32 4
4	33 0	25 0	31 1	24	34 0	26 0	32 7
11	33 0	24 0	31 1	31	35 0	32 0	33 5
18	33 0	25 6	30 10				
25	33 0	25 0	31 8				
July							
2	34 6	25 0	31 5	The average of each over the year			32 8
9	34 6	27 6	32 8				
16	35 0	27 0	32 0				
23	35 6	32 6	34 3				

BARLEY.

OATS.

Date.	Highest Price.	Lowest Price.	Average Price.	Date.	Highest Price.	Lowest Price.	Average Price.
1890				1890			
Jan.	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	Jan.	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
8	32 6	24 6	24 9	8	23 6	18 6	21 2
15	33 6	25 0	30 5	15	23 3	18 0	20 11
22	33 6	27 0	30 6	22	24 0	18 0	20 11
29	33 6	24 0	28 9	29	23 0	18 0	20 7
Feb.				Feb.			
5	33 0	24 0	27 0	5	23 9	18 0	20 8
12	32 6	23 0	30 9	12	22 9	18 0	20 3
19	32 0	24 0	29 4	19	22 6	17 6	19 10
26	31 6	26 0	29 3	26	22 3	17 6	20 2
March				March			
5	33 0	22 0	29 6	5	23 0	17 0	20 8
12	35 0	23 6	29 4	12	24 6	17 9	20 4
19	33 0	25 0	30 3	19	21 6	17 6	20 10
26	31 6	30 0	34 2	26	23 3	18 0	20 11
April				April			
2	34 0	26 0	29 11	2	23 3	17 6	20 3
9	33 9	25 0	30 7	9	24 0	18 0	20 11
16	32 0	27 3	29 7	16	24 0	18 9	21 1
23	33 0	25 6	29 7	23	23 3	19 3	21 5
30	31 6	18 0	28 10	30	23 6	19 0	21 8
May				May			
7	31 6	26 6	29 7	7	23 6	18 6	21 7
14	31 6	27 6	28 10	14	23 0	19 0	21 6
21	30 6	27 6	28 6	21	23 6	19 6	21 6
28	30 6	27 6	29 2	28	23 0	19 0	21 3
June				June			
4	29 0	28 0	28 4	4	23 9	20 0	22 3
11	28 6	26 9	28 0	11	23 6	19 0	21 4
18	28 6	25 6	25 6	18	23 6	19 6	21 8
25	25 6	25 6	25 6	25	23 9	19 0	21 2
July				July			
2	29 0	29 0	29 0	2	23 0	19 6	21 7
9	29 0	29 0	29 0	9	24 0	19 0	21 9
16	28 6	26 6	27 4	16	24 0	18 0	22 1
23	28 6	26 6	27 4	23	25 0	20 3	22 8
30	28 0	27 0	27 3	30	26 6	21 0	23 3
Aug.				Aug.			
6	28 6	26 0	27 9	6	26 6	20 6	24 2
13	30 0	30 0	30 0	13	26 6	20 6	24 5
20	30 0	26 0	27 11	20	30 0	21 0	23 11
27	30 0	26 0	27 11	27	27 0	20 6	23 11
Sept.				Sept.			
3	34 0	27 0	32 3	3	27 6	21 0	23 11
10	35 0	28 0	32 8	10	25 6	20 6	23 3
17	35 0	27 0	31 2	17	23 3	17 6	21 8
24	32 6	26 0	29 0	24	24 6	18 9	21 4
Oct.				Oct.			
1	31 6	22 6	28 10	1	25 3	19 6	21 6
8	32 0	25 0	27 5	8	25 0	19 0	21 4
15	31 0	20 0	27 7	15	24 0	18 6	21 1
22	31 6	22 0	26 8	22	23 0	17 0	20 8
29	31 0	15 0	27 10	29	24 0	18 0	20 10
Nov.				Nov.			
5	32 0	21 0	28 1	5	25 0	17 0	20 0
12	32 0	22 6	27 10	12	23 0	16 0	20 3
19	31 3	17 0	28 1	19	23 0	16 6	19 6
26	32 0	19 0	26 9	26	22 0	17 0	19 9
Dec.				Dec.			
3	32 0	21 0	28 2	3	22 6	17 0	19 9
10	31 0	22 0	28 3	10	23 6	15 6	19 6
17	32 0	22 6	28 1	17	22 6	16 0	19 10
24	30 0	22 0	27 5	24	23 0	15 6	19 10
31	31 0	23 6	27 7	31	22 6	16 0	19 11
The average of each over the year	31 7	24 7	23 11	The average of each over the year	24 0	18 5	21 3

BEANS.

Date.	Highest Price.	Lowest Price.	Average Price.	Date.	Highest Price.	Lowest Price.	Average Price.
1890				1890			
Jan.	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	July	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
8	32 0	32 0	32 0	30	..	..	..
15	31 6	31 6	..	Aug.			
22	31 0	29 6	..	6	..	..	..
29	30 6	30 6	..	13	34 3	34 3	34 3
Feb.				20	34 6	32 0	32 6
5	33 0	29 0	29 0	27	31 6	31 6	31 6
12	38 0	27 6	32 6	Sept.			
19	38 0	28 0	29 9	3	34 6	38 6	34 4
26	38 0	29 0	30 5	10	34 0	32 0	32 6
March				17	..	..	..
5	33 0	28 6	30 2	24	34 0	34 0	34 0
12	34 0	30 0	30 0	Oct.			
19	35 0	28 0	30 2	1	33 6	32 6	32 9
26	32 0	28 6	29 8	8	34 6	32 0	32 8
April				15	32 6	31 0	31 4
2	30 9	24 6	28 10	22	34 6	33 0	33 6
9	30 0	30 0	30 0	29	31 0	31 0	31 0
16	30 9	29 0	29 8	Nov.			
23	31 3	29 0	30 7	5	..	..	..
30	31 6	31 6	31 6	12	33 6	33 6	33 6
May				19	32 0	30 0	31 7
7	..	..	..	26	31 6	31 6	31 6
14	30 9	30 9	30 9	Dec.			
21	..	..	..	3	..	..	..
28	34 6	35 0	35 6	10	..	..	..
June				17	32 0	31 6	31 8
4	32 6	32 6	32 6	24	32 6	32 6	32 6
11	34 3	34 3	34 3	31	..	..	..
18	31 0	31 0	31 0				
25	32 0	31 0	31 6				
July							
2	..	..	..	The			
9	34 0	32 9	33 3	average			
16	33 3	32 0	33 0	of each			
23	33 9	33 9	33 9	over the			
				year	33 0	31 0	31 9

[PRICES

PRICES OF SHEEP SINCE 1818. TABLE NO. 1.—CHEVIOT SHEEP.

Year.	Wethers.				Ewes.				Lambs.						
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.			
1818	28	0	to	30	0	not quoted.			8	0	to	10	0		
1819	25	0	"	27	0	15	0	to	17	0	10	6	"	12	0
1820	20	0	"	25	0	16	0	"	17	0	10	0	"	11	0
1821	18	0	"	20	0	14	0	"	16	0	7	6	"	8	0
1822	12	6	"	13	0	8	0	"	8	6	4	6	"	0	0
1823	13	6	"	18	0	7	0	"	10	6	5	6	"	6	0
1824	14	0	"	19	0	7	0	"	9	0	4	6	"	6	0
1825	20	0	"	32	0	15	0	"	19	0	9	0	"	10	6
1826	17	6	"	21	6	13	0	"	15	0	7	0	"	7	6
1827	15	0	"	24	0	not quoted.			7	0	"	8	0		
1828	18	0	"	27	6	12	0	to	15	0	7	0	"	8	3
1829	18	0	"	24	0	12	6	"	14	0	7	0	"	8	6
1830	15	0	"	21	0	8	0	"	11	0	6	0	"	6	9
1831	18	0	"	25	0	9	0	"	13	0	7	0	"	8	0
1832	19	0	"	24	0	11	0	"	16	0	7	0	"	9	0
1833	22	0	"	31	0	13	6	"	20	0	8	0	"	11	3
1834	22	0	"	31	0	13	6	"	21	0	9	0	"	11	6
1835	22	0	"	27	6	18	0	"	20	6	8	0	"	11	0
1836	24	0	"	31	6	16	0	"	19	0	10	0	"	14	0
1837	19	0	"	28	0	14	0	"	19	0	10	0	"	13	0
1838	23	0	"	30	6	17	0	"	22	0	12	0	"	14	0
1839	23	0	"	31	0	14	0	"	19	0	0	0	"	13	0
1840	24	0	"	33	0	15	0	"	23	0	7	0	"	11	6
1841	23	0	"	30	0	14	0	"	22	0	8	0	"	12	0
1842	22	6	"	28	0	13	0	"	17	0	7	6	"	10	0
1843	19	0	"	25	0	8	0	"	12	0	5	0	"	8	0
1844	21	0	"	59	0	10	0	"	16	0	8	0	"	10	6
1845	23	0	"	33	0	13	0	"	20	0	8	0	"	13	0
1846	24	0	"	33	6	14	6	"	21	6	10	0	"	14	6
1847	24	0	"	35	0	13	0	"	24	0	11	6	"	15	0
1848	23	0	"	34	6	13	0	"	28	0	11	6	"	15	0
1849	21	0	"	30	2	12	0	"	21	0	0	0	"	14	0
1850	20	6	"	29	6	12	0	"	20	0	8	0	"	13	6
1851	21	6	"	31	0	13	0	"	21	0	8	9	"	14	0
1852	21	0	"	32	0	15	0	"	23	0	8	0	"	14	0
1853	26	6	"	38	0	17	0	"	28	6	9	0	"	17	0
1854	25	0	"	36	0	17	0	"	26	0	9	0	"	16	6
1855	23	6	"	36	0	16	0	"	25	0	10	0	"	17	0
1856	22	0	"	35	6	15	6	"	24	0	10	0	"	15	0
1857	24	0	"	36	0	14	6	"	26	0	10	6	"	14	6
1858	24	0	"	34	6	14	0	"	24	6	10	6	"	14	0
1859	25	0	"	34	6	16	0	"	25	0	10	3	"	14	9
1860	26	0	"	38	6	17	6	"	27	6	12	6	"	17	6
1861	25	0	"	38	6	16	0	"	28	0	9	0	"	16	0
1862	27	0	"	37	6	17	6	"	28	0	10	0	"	16	0
1863	25	0	"	38	6	19	0	"	28	6	10	6	"	16	0
1864	31	0	"	41	0	21	0	"	31	6	14	0	"	18	0
1865	32	6	"	44	0	22	6	"	33	6	14	6	"	20	0
1866	37	0	"	50	0	29	0	"	42	6	15	0	"	26	0
1867	26	0	"	58	0	18	0	"	25	6	12	0	"	16	0
1868	30	0	"	32	0	15	6	"	21	0	7	6	"	13	0
1869	28	0	"	38	0	15	0	"	22	6	7	6	"	14	0
1870	35	6	"	43	0	18	0	"	28	0	10	0	"	17	0
1871	36	6	"	49	0	22	0	"	38	6	14	0	"	20	0
1872	45	0	"	56	0	32	0	"	42	0	16	0	"	22	0
1873	42	0	"	51	0	25	0	"	42	0	15	6	"	22	0
1874	33	6	"	44	6	21	0	"	36	0	12	0	"	17	0
1875	33	0	"	48	6	21	0	"	34	0	13	6	"	23	6
1876	40	0	"	52	6	23	0	"	30	0	13	6	"	25	0
1877	41	0	"	51	0	25	0	"	37	0	15	0	"	24	0
1878	35	6	"	48	0	23	6	"	35	0	14	0	"	22	0
1879	34	0	"	44	0	21	0	"	34	0	14	0	"	20	0
1880	30	0	"	43	6	20	0	"	30	0	12	6	"	20	0
1881	32	0	"	45	6	29	0	"	34	0	14	0	"	20	0
1882	40	0	"	51	0	30	0	"	40	0	14	0	"	20	6
1883	44	0	"	55	6	34	0	"	46	6	15	6	"	23	0
1884	36	0	"	47	6	29	6	"	41	6	12	6	"	20	0
1885	30	0	"	38	0	24	0	"	31	0	12	0	"	18	0
1886	32	0	"	40	0	21	0	"	29	0	12	6	"	19	0
1887	29	0	"	36	0	18	0	"	26	0	11	0	"	16	6
1888	30	0	"	38	0	19	0	"	27	0	12	0	"	17	6
1889	36	0	"	44	0	24	0	"	32	0	14	0	"	22	0
1890	31	0	"	40	0	22	0	"	30	0	12	6	"	20	0

TABLE NO. 2.—BLACKFACED SHEEP.

Year.	Wethers.		Ewes.		Lambs.	
	s.	d.	s.	d.	s.	d.
1819	22	0 to 24	12	0 to 15	8	0 to 9
1820	20	0 " 23	15	6 " 17	7	0 " 8
1821	18	0 " 20	12	0 " 13	6	0 " 7
1822	11	6 " 13	5	6 " 6	4	6 " 0
1823	12	0 " 10	5	0 " 6	4	0 " 5
1824	9	6 " 13	6	0 " 7	4	0 " 5
1825	22	0 " 26	11	0 " 13	6	0 " 9
1826	15	0 " 17	8	0 " 9	4	6 " 6
1827	14	0 " 18	7	0 " 10	6	0 " 7
1828	15	0 " 20	8	0 " 11	5	0 " 7
1829	14	0 " 18	9	0 " 10	6	0 " 7
1830	9	6 " 13	4	0 " 6	4	6 " 6
1831	13	0 " 17	5	0 " 7	5	0 " 6
1832	14	0 " 18	7	0 " 11	6	0 " 7
1833	16	0 " 24	7	6 " 12	6	6 " 9
1834	16	0 " 22	10	0 " 13	6	0 " 8
1835	15	0 " 18	10	0 " 13	7	0 " 8
1836	15	0 " 21	9	0 " 12	8	6 " 11
1837	13	0 " 16	8	0 " 12	8	0 " 9
1838	15	0 " 20	10	0 " 13	not quoted.	
1839	15	0 " 22	10	0 " 12	7	0 to 8
1840	15	0 " 22	11	0 " 12	7	0 " 9
1841	16	0 " 20	9	0 " 11	6	0 " 8
1842	14	0 " 19	7	6 " 8	5	6 " 7
1843	not quoted.		4	9 " 6	not quoted.	
1844	15	0 to 21	6	6 " 10	5	0 to 8
1845	14	0 " 23	8	0 " 12	6	0 " 8
1846	13	0 " 24	10	0 " 13	8	0 " 9
1847	20	6 " 25	10	0 " 14	8	6 " 9
1848	20	0 " 24	11	3 " 12	8	6 " 10
1849	not quoted.		not quoted.		7	0 " 7
1850					7	0 " 0
1851	17	6 to 23	9	0 to 12	6	6 " 8
1852	18	6 " 22	9	6 " 12	4	6 " 7
1853	23	0 " 27	14	6 " 16	8	0 " 11
1854	20	0 " 26	11	0 " 16	8	0 " 10
1855	23	6 " 26	14	0 " 16	10	0 " 11
1856	17	0 " 24	10	0 " 20	7	6 " 10
1857	20	0 " 29	10	6 " 15	9	3 " 11
1858	20	0 " 27	9	9 " 18	8	3 " 10
1859	20	0 " 25	10	0 " 14	8	9 " 11
1860	21	0 " 27	11	0 " 16	10	0 " 13
1861	21	0 " 29	12	0 " 22	6	3 " 14
1862	16	9 " 27	12	0 " 18	6	0 " 12
1863	20	0 " 30	13	0 " 16	8	0 " 11
1864	25	0 " 30	15	0 " 19	10	0 " 13
1865	15	6 " 32	15	0 " 25	10	0 " 17
1866	31	6 " 40	20	0 " 36	13	6 " 22
1867	20	0 " 30	14	0 " 22	7	6 " 13
1868	20	0 " 26	10	6 " 13	7	0 " 13
1869	22	0 " 28	11	0 " 14	6	9 " 9
1870	27	0 " 32	13	0 " 22	8	0 " 14
1871	23	0 " 37	13	0 " 23	11	0 " 16
1872	31	6 " 45	18	0 " 32	12	6 " 18
1873	28	0 " 39	16	6 " 27	7	0 " 16
1874	25	0 " 35	18	0 " 20	7	0 " 14
1875	26	6 " 37	15	0 " 21	9	6 " 17
1876	30	0 " 40	19	0 " 24	13	0 " 20
1877	35	0 " 38	18	0 " 25	13	6 " 23
1878	30	0 " 36	17	0 " 23	12	0 " 22
1879	25	0 " 35	16	0 " 24	10	6 " 20
1880	25	0 " 38	16	6 " 22	10	0 " 17
1881	30	0 " 39	15	0 " 23	10	0 " 15
1882	33	0 " 43	20	0 " 28	12	6 " 18
1883	35	0 " 50	24	6 " 33	14	0 " 21
1884	29	0 " 43	19	6 " 28	12	0 " 19
1885	24	0 " 34	18	0 " 22	10	0 " 15
1886	25	0 " 34	12	0 " 22	10	6 " 16
1887	22	0 " 30	11	0 " 19	8	0 " 13
1888	22	0 " 32	13	0 " 24	10	0 " 15
1889	26	0 " 40	18	0 " 29	13	0 " 22
1890	24	0 " 37	14	0 " 27	10	6 " 19

TABLE NO. 3.—PRICE OF WOOL, PER STONE OF 24 LB., SINCE 1818.

Year.	Laid Cheviot.		White Cheviot.		Laid Highland.		White Highland.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1818	40 0	to 42 2	..	..	20 0	to 22 6	..	..
1819	21 0	" 22 0	..	..	10 0	" 10 3	..	..
1820	20 0	" 22 0	..	..	9 0	" 10 0	..	..
1821	18 0	" 20 0	..	..	9 0	" 10 0	..	..
1822	12 6	" 14 6	..	..	5 0	" 6 6	..	..
1823	9 0	" 10 6	..	..	5 0	" 5 9	..	..
1824	18 6	" 15 0	..	..	6 0	" 6 8	..	..
1825	10 6	" 22 0	..	..	10 0	" 10 6	..	..
1826	11 0	" 14 0	..	..	5 0	" 5 6	..	..
1827	11 0	" 14 0	..	..	5 6	" 6 9	..	..
1828	8 0	" 11 0	..	..	5 6	" 6 0	..	..
1829	8 6	" 11 0	..	..	4 3	" 0 0	..	..
1830	9 6	" 11 0	..	..	4 6	" 5 0	..	..
1831	17 0	" 20 0	..	..	7 6	" 8 6	..	..
1832	14 0	" 16 0	..	..	7 0	" 7 6	..	..
1833	18 0	" 20 7	..	..	10 0	" 11 0	..	..
1834	21 0	" 24 6	..	..	5 6	" 7 0	..	..
1835	19 0	" 20 6	..	..	9 6	" 10 8	..	..
1836	21 0	" 25 0	..	..	10 0	" 14 0	..	..
1837	12 0	" 14 0	..	..	7 0	" 7 8	..	..
1838	19 0	" 22 6	..	..	6 0	" 10 0	..	..
1839	18 0	" 20 0	..	..	8 0	" 12 0	..	..
1840	15 0	" 0 0	..	..	7 0	" 0 0	..	..
1841	15 0	" 16 9	..	..	6 0	" 7 5	..	..
1842	12 6	" 14 0	..	..	not quoted.		..	..
1843	9 0	" 11 6	..	..	5 0	to 6 0	..	..
1844	15 0	" 18 0	..	..	not quoted.		..	..
1845	14 6	" 17 6	..	..	7 6	to 8 6	..	..
1846	12 0	" 14 6	..	..	8 0	" 8 6	..	..
1847	12 6	" 14 0	..	..	not quoted.		..	..
1848	9 6	" 11 0	..	..	4 9	to 0 0	..	..
1849	12 0	" 16 6	..	..	6 0	" 6 3	..	..
1850	15 0	" 17 6	..	..	8 0	" 8 6	..	..
1851	12 0	" 16 0	..	..	8 0	" 9 3	..	..
1852	13 0	" 15 0	..	..	8 0	" 9 0	..	..
1853	19 0	" 22 0	..	..	11 0	" 12 6	..	..
1854	12 0	" 15 0	..	..	7 6	" 8 6	..	..
1855	14 6	" 19 0	..	..	8 6	" 9 0	..	..
1856	19 0	" 21 6	..	..	11 0	" 0 0	..	..
1857	19 0	" 24 0	..	..	13 0	" 14 3	..	..
1858	15 0	" 17 0	..	..	8 9	" 10 0	..	..
1859	18 6	" 24 0	..	..	10 9	" 11 6	..	..
1860	22 0	" 32 0	37 0	to 38 0	10 0	" 11 3	..	..
1861	19 6	" 27 0	from 30s. upwards.		not quoted.		..	..
1862	18 6	" 26 0	30 0	to 37 0	11 6	to 16 0	..	..
1863	25 6	" 31 0	38 0	" 42 0	15 3	" 17 6	..	..
1864	31 0	" 39 0	47 0	" 54 0	17 6	" 20 0	..	..
1865	23 0	" 30 0	44 0	" 45 0	15 0	" 17 0	..	..
1866	24 0	" 30 6	30 0	" 38 0	14 0	" 16 0	..	..
1867	16 0	" 21 6	not quoted.		not quoted.		..	..
1868	19 0	" 26 0	28 0	to 32 0	8 6	to 9 0	..	..
1869	18 0	" 26 6	not quoted.		8 6	" 10 0	..	..
1870	15 0	" 23 6	25 0	to 26 0	9 6	" 0 0	..	..
1871	20 0	" 26 6	30 0	" 34 6	12 0	" 15 0	..	..
1872	26 0	" 37 6	40 0	" 48 0	18 0	" 21 0	..	..
1873	17 0	" 18 0	34 0	" 40 0	9 0	" 12 0	..	..
1874	18 6	" 26 6	30 0	" 34 0	9 6	" 13 0	..	..
1875	25 0	" 32 0	34 6	" 36 0	12 6	" 16 0	..	..
1876	20 0	" 24 0	30 0	" 34 6	9 6	" 12 0	..	..
1877	20 9	" 26 0	28 0	" 30 0	10 0	" 12 0	..	..
1878	18 9	" 25 0	27 0	" 32 0	8 6	" 11 6	..	..
1879	15 0	" 17 0	prices very low.		7 0	" 0 0	..	..
1880	20 0	" 24 0	30 0	to 32 0	10 6	" 11 6	14 0	to 15 0
1881	17 0	" 21 0	27 0	" 30 0	5 0	" 9 6	12 0	" 13 0
1882	14 0	" 18 0	27 6	" 28 0	7 6	" 9 0	13 0	" 14 0
1883	13 0	" 18 0	26 0	" 28 0	6 6	" 8 6	11 6	" 12 6
1884	13 0	" 18 0	26 0	" 28 0	6 6	" 8 6	11 6	" 12 6
1885	12 0	" 17 0	22 6	" 26 0	6 0	" 8 0	11 6	" 12 0
1886	13 0	" 18 0	23 0	" 27 6	6 6	" 8 6	11 6	" 12 0
1887	14 0	" 22 0	23 0	" 28 0	7 0	" 9 0	11 6	" 18 0
1888	13 0	" 20 0	23 0	" 28 0	7 0	" 9 0	11 0	" 12 6
1889	13 0	" 18 0	24 0	" 28 0	7 0	" 9 0	11 0	" 12 6
1890	13 0	" 18 0	24 0	" 28 0	7 0	" 9 0	11 0	" 12 6

TRIALS OF GRIST-MILLS AT DUNDEE SHOW, 1890.

PREMIUMS of £15 and £10 were offered by the Society for competition on the occasion of the Dundee Show, under the following conditions: The mill to kibble, grind into fine meal, or bruise beans, Indian corn, oats, wheat, barley, and linseed, or a mixture of these as required by the Judges,—power and materials to be supplied by the Society. The price of the machine not to exceed £25; the indicated horse-power required not to exceed eight horse-power. The price, as entered in the catalogue, must be held the same till after the trials are over. The Directors shall have the power to withhold the prizes where there is not sufficient merit, or to apportion them as they think best.

To facilitate the trials being made without loss of time, a main shaft, 50 feet long $\times$ 2½ inches diameter, was erected in the motion-yard, and pulleys of the necessary size were keyed on the shaft to drive the mills at the proper speed,—a traction-engine of ten horse-power having been placed in a suitable position to drive the main shaft.

Seventeen mills were entered for competition, but the Judges were requested by the competitors to try only nine.

The following are the names of the exhibitors who entered mills for competition:—

Stand.	Catalogue Nos.
5. Blackstone & Co., Stamford	47, 48
53. W. N. Nicholson & Sons, Newark-on-Trent	840 to 844
120. Woodroffe & Co., Rugeley	1408, 1409, 1410
122. William Balfour, Pittenweem	1417
123. Barford & Perkins, Peterborough	1422, 1423
132. R. G. Morton, Errol	1464 to 1467

The competitors were supplied with 100 lb. each of maize, beans, oats, barley, and wheat, and 25 lb. of linseed; also 25 lb. of mixtures each—oats, barley, and beans; also 25 lb. of oats, barley, beans, and 15 lb. of linseed as mixtures.

After careful and exhaustive trials, extending to three days, the Judges—Mr Jonathan Middleton, Clay of Allan, Fearn, Ross-shire, Mr John Kerr, Broomhouse, Corstorphine, assisted by James D. Park, Engineer to the Society, Edinburgh, resolved to divide the amount of premiums (£25) into three prizes of £12, £7, and £6, and awarded them as follows:—

1. £12 to Messrs Woodroffe & Co., Rugeley, for their Mill, BME. Price £21.

2. £7 to Messrs Barford & Perkins, Peterborough, for their Mill, No. 4. Price £16.

3. £6 to Messrs Blackstone & Co., Stamford, for their Mill, T.A. Price £13, 10s., especially for making soft meal.

ARRANGEMENT OF MACHINERY AT A FARM-STEADING

FOR THE CONVENIENT PREPARATION OF FARM AND PURCHASED FOOD FOR LIVE STOCK.

By JOHN ROSS, Meikle Tarrel, Fearn, Ross-shire.

A VERY great stride in the requirements of modern agriculture is indicated by the title of this paper. Hitherto the food of the farm has seldom been mechanically prepared on the farm for live stock, and purchased foods have generally been bought ready for convenient consumption. The great changes that have taken place in our system of farming, as well as the general conditions that affect our industry, are such that we must strive, if we are to be successful, to turn modern science with its various appliances to our advantage. We have often been told that the man who made two blades of grass grow where only one grew before was a benefactor of his country, and many farmers put forth their best endeavour to accomplish this great end. The further development of this idea, however, was too often overlooked—viz., how best to secure and utilise the two blades when they were grown. We may surely say that the farmer who, by mechanical preparation or otherwise, is able to make one pound of prepared food equal to two unprepared, is entitled to equal praise. If the acreage of our turnip crop, for instance, could be reduced by one-half without a corresponding reduction in the number of live stock bred or fed on the farm, the saving of labour alone would be very considerable; and this is a matter of daily increasing importance in face of a decreasing rural population, and the wellnigh impossibility of obtaining female outworkers in many districts.

The direct benefits from prepared farm and purchased food for live stock are so many, that it is necessary to mention only a few of them to show the great advantage this system has over the unprepared. Horses can be more economically and safely fed on bruised oats and cut hay or straw, or a mixture of hay and straw, according to work required of them. Cattle can have their food so prepared that no one outstanding food, such as turnips or cake, is unduly looked for at feeding time: they can eat their fill in shorter time and with perfect safety—never any danger of a choke. The albuminoid ratio can also be more perfectly and easily adjusted, and the whole mass rendered more digestible. For breeding stock, the preparation and mixing of foods is invaluable: the danger from frosty turnips for in-calf cows is removed, as also that from choking or hoven in

cows about to drop their calves. The quality of the food can also be more easily regulated, according to the requirements of the different classes of stock.

Feeding sheep can have a breakfast prepared for them at the steading of such a satisfying nature that they will not trouble the turnip-boxes until they have well rested. Ewes, like cows, can get their food in the safest form, and regulated according to their condition. Animals fed on prepared food need never be checked in their progress by a change from one kind of food to another: this can be done so gradually as to be quite imperceptible to the animal.

On small and moderate sized farms very little arrangement of buildings was formerly necessary; the live stock were offered what straw they would eat of their own accord, and the balance was used as litter. Hay received very little better attention, and turnips were dealt with in the same easy fashion—convenient stores being found at almost every door. Now that farms increase in size and larger steadings are required, it is absolutely necessary that more complete arrangements be made for the convenient storage of a larger quantity of straw and turnips, and for their more convenient distribution. When we go a step further and seek mechanically to prepare our straw and turnips for live stock, and provide suitable appliances and accommodation for the preparation of farm and purchased food, the arrangements become much more complex, and no doubt many are prevented attempting what they believe would be advantageous in many respects by the unsuitableness of the buildings they already occupy, while many others prefer the convenient cake or condiment, which, while they save much personal supervision, calculation, and forethought, are not to be compared for economical and reliable feeding value to farm produce when properly prepared and mixed with purchased foods.

The machinery required for preparing those foods is a motive power—water or steam. A threshing-machine, chaff-cutter, grist-mill, corn-bruiser, cake-crusher, and their accessories, and the systematic arrangement of the foregoing, is the problem now before us.

It will greatly help us if we keep the following leading ideas as to the relative positions of the various buildings in view. The straw-barn, with threshing-mill at one end, will be found most convenient when placed upon an upper floor right across the centre of the steading, intersecting feeding-byres and stable wings at right angles, giving direct access, right and left, to all byres, courts, and stable from its floor.

The cake and meal stores, with machinery for their preparation, and the turnip-stores, with pulpers and cutters for their

preparation, should be placed one on each side of mill-end of the straw-barn.

For the economical preparation and storage of the straw, cake, meal, and turnips in their separate buildings, we require at the outset a motive power, which must be sufficient and available at all times and in all weathers; and unless there be an ample supply of water, the advantages of steam-power will more than counterbalance the cost of coals; and in addition to a motive power always at command, there is a ready means for further preparing by thoroughly boiling all meals made from farm produce, and such of the purchased foods as may be improved thereby.

For the preparation of straw we require a threshing-machine, which should stand out beyond the line of steading and thresh into the end of the straw-barn, along which the straw may be conveyed by carrier or otherwise. To prepare such straw as may be required for mixing with meal, cake, or turnips, we need a chaff-cutter, which should sit at the tail of the shakers, or where the straw could readily be conveyed to it by straw-carrier direct from the mill, so saving the double handling of the straw. The position of the chaff-cutter should also be such that hay can be delivered into it direct from the cart or straw-carrier, and where at all possible, it should stand in line with the mill and straw-barn—a portion of the latter next the chaff-cutter being lined off for chaff-stores, which may be intersected by a light division to keep the hay and straw separate. In order to store cut straw or hay, a "Blower," set to receive the cut stuff from the chaff-cutter, is the most efficient machine. The tube—a square wooden box will suffice—should be carried along the division between the cut hay and straw stores, and with simple side openings the chaff will be delivered into its proper compartment without any manual labour whatever. Should it be considered desirable to cut litter from the mill, this blower and tube become available for delivering the litter into the straw-barn right beyond the chaff-stores.

The machinery required for the preparation of cake, meal, &c., are a grist-mill for making meal for cattle, pigs, &c.; a corn-bruiser for preparing corn for horses, sheep, &c.; and a cake-crusher. The grist-mill and bruiser are most convenient when set upon frames close up under second floor, having sufficient space underneath for storing meal and bruised corn. The upper floor may be used as a storeroom for all kinds of grain and cake intended for feeding purposes. When grain sufficient for a day's grinding or bruising is mixed and heaped in "bunks," having small holes in their floors communicating with the hoppers of grist-mill and bruiser, the manual labour required to feed a machine so placed, and to store the meal underneath,

is reduced to a minimum. The cake-crusher should stand upon the second floor, right above the division between two bunks underneath for holding the broken linseed and cotton cake, a simple "shut" directing the cake to its proper compartment. For the preparation of turnips we have slicers, finger-cutters, and pulpers, any of which can be used according to the system of cattle and sheep breeding or feeding carried out on the farm.

We have now the straw, cake, meal, &c., and turnips prepared in their respective stores; and for the purpose of mixing these in the variously required quantities and proportions with the least possible amount of daily labour, we require a suitable mixing-house where the different feeding-stuffs may be conveniently collected, mixed, and stored ready for distribution. Space for this can be found on the ground-floor underneath the cut straw and hay stores, from which cut straw and hay may be run down through hatchways in the floor into cement receptacles underneath. If the grist-mill, bruiser, and cake-crusher are ranged alongside one another in the building already suggested, at right angles to straw-barn and on one side of the cut straw and hay stores, direct access from the mixing-house may be had by a passage along the stores for meal, &c., and cake, while on the other side we have prepared turnips at hand for any mixture we may wish to make. Part of floor underneath straw-barn should be used as a centre roadway giving access right and left to byres, courts, &c., from the mixing-house at one end, and from the outside at the other end by an archway large enough to admit a cart of green food for summer feeding. This would give every convenience for the distribution of all kinds of winter and summer feed from one centre, and also for the complete and careful oversight of the stock.

If steam be the motive power, a pipe from the boiler can be so arranged as to pass above a number of wooden barrels placed on end along the side of mixing-house, and by introducing a small jet of steam into those barrels a simple and economical method of further preparing food for stock by boiling is secured. If the barrels are properly placed, their contents, after being thoroughly boiled, may be run over a mixture of cut straw or hay in concrete receptacles underneath; and with the addition of a small quantity of treacle, any required quantity of bulky and palatable food may be prepared to take the place commonly assigned to turnips.

Water is now a necessity in every well-ordered steading, and if a good supply cannot be got by gravitation, all that may be required for drinking and cooking purposes may be pumped by machinery to cisterns conveniently placed in the steading.

To many the expense of raising steam daily may seem a diffi-

culty in the way. When, however, a locomotive boiler is used, and every care taken in firing, &c., 1 cwt. of coals a-day is quite sufficient to do all the turnip cutting or pulping, cake-breaking, water-pumping, and steaming meal and cake for 120 to 150 head of cattle; and the expense at 1s. or 1s. 3d. per cwt. is little in comparison to the manual labour required for those purposes, without taking into account the great saving effected by feeding with meals, &c., thoroughly prepared by boiling.

To others the daily labour in connection with such a system as we have endeavoured to point out may seem insuperable; but if proper arrangements of machinery are carried out, the labour required is very little. To help in this direction, it is highly desirable to have the motive power transmitted by belt or otherwise to one main shaft running alongside the cake and meal stores, crossing the mill at right angles, and available at the other side for pulping or cutting turnips. From this shaft the required power may be taken off at any point for driving the various machines, any or all of which can be at work at the same time—care being taken that the shaft and all belts, &c., be so arranged and protected that there be no danger to the workpeople employed. With such an arrangement the supervision and oiling of the machinery are easily done by the man in charge of the engine, who also can see that the grist-mill and bruiser are feeding themselves, and at the same time do all the necessary steaming in the mixing-house in the hour or hour and half that may be taken by the cattlemen to get their turnip work and mixing done. In this way the extra daily labour need deter no one from carrying out such an advantageous operation as the preparation, both mechanically and by boiling, of farm and purchased food for live stock.

POTATO-BLIGHT.

Letter from ALFRED W. TAIT, Fellow of the Linnæan Society, Royal Horticultural Society, &c., to ALLAN BUCHANAN, Esq., of Buchanan Brothers, 13 Princes Square, Glasgow.

115 ENTRE QUINTAS, OPORTO,
PORTUGAL, 20th Nov. 1890.

DEAR SIR,—You have asked me to give you particulars of the circumstances which led to the discovery of the treatment and cure of potato-blight in this country by means of the

"Anti-Blight" preparation, and also my experience as to the best means of applying it.

Being, as you know, interested to a large extent in vine-growing and wine-making, I have for some time past studied the treatment of the vine-blight or mildew (*Peronospora viticola*), which is closely allied to the potato-blight.

The vine-blight has for some years been successfully treated by means of solutions of sulphate of copper, &c.; but there were many drawbacks to this treatment. A special and expensive apparatus is necessary, and a certain amount of skill is required, otherwise the remedy is wastefully used.

Several preparations in the form of powder had been tried, but they were not properly prepared, and consequently were not satisfactory, so I gave my attention to the preparing of a powder so combined and prepared as to be free from the objections hitherto experienced. The French official reports and those published by the American Government, which they kindly furnished to me, showed where the defects lay; and I trust that the present preparation will be found to act satisfactorily. Last season several large growers in the port-wine districts tried it, and have obtained such good results that they intend to treat all their vines next spring. *Hearing that the potato-blight had appeared, I recommended two of my friends to try the remedy, and they report that the disease was at once checked, and a full crop of sound potatoes harvested; also that they had cured the white mould on their fruit-trees with it.*

The mode of application is very simple. India-rubber distributors, costing in England about 2s. to 2s. 6d. each, are to be nearly filled with the powder, which, by pressure on the india-rubber body, is dusted on to the leaves, especially *under them*. This is done by inserting the pulveriser among the plants and expelling the powder upwards. The application should be made after rain, or in the morning, when possible, as the powder adheres better to the leaves.

As to the quantity of the preparation required to treat an acre of potatoes, I cannot give a practical opinion; but I think that half a cwt. per acre should be enough. This point can only be decided by experiment.

Trusting that the potato-blight will be as successfully cured by this mixture as the vine-blight has been, I remain, yours faithfully,

ALFRED W. TAIT.

CHEMICAL DEPARTMENT.

REPORTS by Dr A. P. AITKEN, Chemist to the Society.

PUMPHIERSTON EXPERIMENTAL STATION.

REPORT ON GRASS EXPERIMENTS, 1890.

THE grass crop at Pumpherston is now in its third year, and has been cut for silage or hay each year. This year the crop was made into hay. The system of manuring that was adopted in the year 1878 is still continued over nearly two-thirds of the station, so far as the kinds of manure applied are concerned; but the quantities have varied according to the crop. Now that the station is under permanent grass, the quantities of manure applied annually will remain fixed, at least as regards section A of the station. The quantities applied in 1890 are given on Table III. They are so arranged that each plot of one-twelfth acre receives three pounds phosphoric acid, of ammonia, and of potash respectively, whatever be the nature of the manure. Thus plot 10, which may be taken as an example of the fully manured plots, receives the following manures:—

	lb. per acre.
Superphosphate	288
Nitrate of soda	192
Kainit	288

The objects of the experiment are—

1. To see whether there is any difference in the quantity and quality of the grass produced by the application of manures which are all of the same strength, but composed of different materials. Some of these are cheap, others are dear; some are soluble, others are insoluble; some are bulky, others not.

2. To discover what is the relative importance to a grass crop of each of the ingredients of a manure, and to see how the continued absence of one or two ingredients affects not only the bulk of the crop, but also the character of the herbage, so that it may be possible, by examining the herbage of a meadow, to tell what is the manurial constituent most deficient in the soil. For this purpose there is a set of plots incompletely manured—viz., plots from which each of the three essential ingredients in turn is entirely withheld, and others from which two of the three ingredients are entirely withheld.

3. There is a series of plots which, for ten years, have been deficiently manured in that way, and which are now receiving only those ingredients which have formerly been withheld, to discover if the ingredients formerly supplied, and presumably present in the soil in excess, are still available for the growth of grass, and to what extent they are available.

4. There is a set of plots which are receiving nitrogenous manures in three different proportions, to see how the quantity and quality of the herbage is affected thereby, and the grass from these plots is being annually analysed to see what is the effect of increasing quantities of nitrogen on the feeding quality of the grass.

5. There are plots to show the effect of rolling and harrowing upon the grass.

6. There are plots on which all manuring has been discontinued, for varying numbers of years, to see how rapidly their fertility is thereby diminished.

To this last inquiry nearly one-third of the station has been devoted. The rood-plots into which the station was originally divided have been cut into three equal parts, and the middle third of each belongs to what is called the unmanured or B section. It will be convenient to notice the amount of crop produced on it in the first place. It is shown on Table IV., along with the two previous hay crops, and a comparison of the three columns shows that the crop is a small one, averaging 23 cwt. per acre, as against 27 cwt. in 1889. This does not necessarily prove that the land is falling back very rapidly in fertility, for the hay crop is subject to great variation according to the nature of the season. The weather during 1889 was very unfavourable for the hay crop in the district, and the diminution in the amount of crop is probably due to the cold inclement summer as much as to anything else.

There are still to be seen on the unmanured plots considerable differences of produce, which are due in part to the different sources of the manures applied to them before 1886; but the time has not yet come again for drawing any sharp distinctions in regard to the residual fertility derived from the various manures of former years. It is evident that the differences seen in the amount of produce are in part to be accounted for by the differences in the kind of herbage growing on the different plots of this section. The herbage, which three years ago consisted of ryegrass chiefly, is now rapidly falling under the natural grasses, and until these plots have settled down into a permanent condition we should be misled in drawing conclusions in regard to residual fertility. While this is the case with the unmanured section, it is still more so with the sections A and C, Table V., which are annually having dif-

ferent manures applied to them. The phase of these experiments which is at present of interest is not the quantities of hay the various plots are producing, but the quality of the herbage, which is undergoing very rapid and characteristic change.

The chief interest therefore attaches to Tables VI., VII., and VIII., showing the predominance of the various species of the grasses proper, and the weights per cent and per acre of the different kinds of herbage.

BOTANICAL ANALYSES OF THIRD YEAR'S GRASS.

A comparison of these tables with those of the two former years shows that an extraordinarily rapid change is going on all over the station. The change is more rapid on some plots than on others, and it is one of the objects of this experiment to discover how the predominance of one species over another is influenced by the nature of the manure applied in the case of a field which has been under a close rotation, and is sown out with grass intended to lie for a number of years. Before examining the plots individually, it is instructive to notice what are the broad general changes that have come over the field since the first crop was taken in 1888.

In that year the crop consisted of about 50 per cent rye-grass, 40 per cent clover, 5 per cent natural grasses, and 5 per cent weeds. In the year following the crop consisted mainly of the grasses, owing to the disappearance of clover, which constituted only about 5 per cent of the total herbage. If we neglect the clovers entirely, and confine our attention to the grasses proper, the following numbers will represent approximately the percentage of the various species by weight in each of the three years:—

TABLE I.—ALTERATION OF MEADOW GRASS IN THREE YEARS.

	1888.	1889.	1890.
Ryegrass	89	44	15
Cocksfoot	...	12	25
Timothy	5	12	7
Dogtail	0.5	17	36
Foxtail	...	0.2	...
Meadow grasses (poas)	3	7.5	2.5
Fescues	0.3	2.5	3
Yorkshire fog	2.2	4.8	11.5
	100.0	100.0	100.0

The ryegrass is reduced in three years to one-sixth of its bulk. Cocksfoot, which during the first cutting had not made its appearance, now constitutes one-fourth of the hay. Crested dogstail, which was just visible the first year, now constitutes one-third of the hay. Yorkshire fog is increasing pretty rapidly. The fescues are slowly gaining ground, and the poas and also timothy are already showing signs of giving way.

The ryegrass has fulfilled its function of filling up the ground until the more slowly growing but more strongly rooting grasses have established themselves. There is a strong competition between crested dogstail and cocksfoot for occupation of the ground. Four times as many seeds of cocksfoot were sown as there were of dogstail, but the latter was first to take up a position in the pasture. It owes its present supremacy to its earlier start; but as it is the prevailing grass all over the district, it is probable that it also owes it to some conditions of soil or circumstances of growth that we have yet to discover. The conditions, whatever they are, seem to be very uncongenial to meadow foxtail, which merely looked in on the second year, and then disappeared.

In the present transition state of the grasses the plots on the station are not capable of being used to demonstrate the effects of manures upon the various grasses. They will arrive at that stage by-and-by. In the meantime, however, we can see some indications which it may be useful to note, so that our attention may be called to them more specially hereafter.

When the land is rich in nitrogen, the grass that flourishes most of all is ryegrass: the more nitrate it gets, the more it predominates over the other grasses; when the nitrogenous matter is insoluble, it does not fare so well.

Where nitrogen is deficient, or in an insoluble form, the crested dogstail and the Yorkshire fog take possession of the ground.

Where phosphates are deficient, fescues, but especially the smaller fescues, predominate; and cocksfoot also grows very well.

Where potash is deficient ryegrass does very well, but the poas and fescues are very backward, and cocksfoot also is retarded. The same cannot be said of Yorkshire fog, which seems to be able to flourish without much potash.

An inspection of Tables VI., VII., and VIII. will show how the different species of grass were affected by the different manures last year; but though these are facts, they are not facts regarding permanent meadow grasses, for the meadow is not yet in the state called "permanent."

The experiments going on on the plots beyond No. 30 are mostly in a transition stage and need not at present be reported,

but those on plots 31 to 34 call for special mention. On plots 31 and 32 the experiment of the former year was repeated—namely, an experiment to show the effect of different quantities of nitrate of soda on the quantity and quality of the grass crop. These two-rood plots were each divided into three parts, which, besides receiving their proper quantity of phosphate and potash salts, were top-dressed with nitrate of soda at the rate of 1, 2, and 3 cwt. per acre of nitrate of soda respectively. The general result was that an addition of about 6 cwt. of hay was got for each increase of 1 cwt. nitrate, and that the feeding quality of the grass as determined by chemical analysis was not affected thereby. The experiment was repeated on the same ground last year, with increased quantities, and with the results described below. In addition to that, plots 33 and 34 were similarly treated; but instead of nitrate of soda a top-dressing of sulphate of ammonia was applied in equivalent quantity to the nitrate. The results were:—

TABLE II.—EFFECT OF SOLUBLE NITROGENOUS MANURE ON GRASS CROP.

		Nitrate of Soda per acre.		
Per Acre		144 lb.	288 lb.	432 lb.
Plot 31	. . cwt.	33	36	55½
Plot 32	. . "	37½	40½	48
		Sulphate of Ammonia per acre.		
Per Acre		120 lb.	240 lb.	360 lb.
Plot 33	. . cwt.	30	54	57
Plot 34	. . "	31½	45	48

It is seen that the quantity of crop is again increased, and though not with the same regularity as in the former year, yet with far more telling effect. It might have been expected that plots 31 and 32, which had been heavily top-dressed with nitrate for the second time in successive years, would have shown some sign of exhaustion, but, on the contrary, there was a tremendous crop of hay on the part which got the triple dose

of nitrate. How long that apparently increased "fertility" will last remains to be seen. The sulphate of ammonia plots (33 and 34) show even more strikingly the effect of heavy top-dressings in increasing the grass crop.

The grass from each section of these plots was analysed, to see if the quantity of crop was got at the expense of feeding quality, and the analyses are shown on Table IX., p. 202.

It is quite remarkable how little the quality of the grass has been affected by the increasing quantity of nitrogenous manure; nevertheless there are differences noticeable, and they are more pronounced than they were the former year. These differences are so regular in both series of plots that we need not hesitate to generalise from them. The chief effect of these top-dressings is to increase the proportion of nitrogenous constituents, more especially the albumen. The amides, &c., do not seem to be so much increased thereby, and, strange to say, there was only the merest trace of nitrates in that part of the hay that got nearly 4 cwt. per acre of nitrate of soda.

With the increase of albumen there is a corresponding diminution in the carbohydrates, and in the set that got nitrate there is a marked diminution in the proportion of woody fibre, but the ash is notably increased.

The absence of nitrate in the hay heavily top-dressed with nitrate is of much interest, for there is a common belief that stock, and especially horses, are injuriously affected by eating grass, and even hay, that has been heavily top-dressed with nitrate. The injury is said to be such as might be produced by dosing with nitre; but it is evident that if any injury is done it must be due to something else than the presence of nitrate in the tissues of the grass or hay itself.

The same experiments will be tried again on these plots this year, and the botanical analyses, which are still more interesting, will be noted as they have been in the previous years. The results, so far as they have gone, tend to allay the dread that in the application of top-dressings of nitrate of soda and sulphate of ammonia to grass there is an inevitable and rapid deterioration of the fertility of the soil, and that on that account such top-dressing is a violation of the laws of good husbandry; but it is all-important to remember that along with these applications of soluble nitrogenous manure there is annually applied a liberal dose of the other constituents which grass requires for its nourishment.

TABLE III.—MANURES APPLIED IN APRIL 1890 (LB.), SECTION A.

No. of Plot.	Bone-meal.	Dissolved Bones.	Steamed Bone-flour.	Thomas-slag.	Mineral Phosphate.	Superphosphate.	Nitrate of Soda.	Sulphate of Ammonia.	Horn-dust.	Meat-meal.	Castor-dust.	Peruvian Guano.	Fish Guano.	Ichaboe Guano.	Kainit.	Sulphate of Potash.	Muriate of Potash.
5	13	..	..	..	..	..	12	..	..	..	..	..	..	..	24	..	..
6	..	22	..	..	..	..	12	..	..	..	..	..	..	..	24	..	..
7	..	..	11	..	..	..	14	..	..	..	..	..	..	..	24	..	..
8	..	..	..	18	..	..	16	..	..	..	..	..	..	..	24	..	..
9	..	..	..	..	12	..	16	..	..	..	..	..	..	..	24	..	..
10	..	..	..	..	..	24	16	..	..	..	..	..	..	..	24	..	..
11	..	..	..	..	..	..	16	..	..	..	..	..	..	..	24	..	..
12	..	..	..	..	..	24	..	..	..	..	..	..	..	..	..	..	..
13	..	..	..	..	..	24	16	..	..	..	..	..	..	..	24	..	..
14	..	..	..	..	..	24	..	13	..	..	..	..	..	..	24	..	..
15	..	..	..	..	..	24	..	..	17	..	..	..	..	..	24	..	..
16	..	..	..	..	..	24	..	..	25	..	..	..	..	..	24	..	..
17	..	..	..	..	..	24	..	..	..	..	..	..	..	..	24	..	..
18	..	..	..	..	..	..	16	..	..	..	..	..	..	..	..	..	..
19	..	..	..	..	..	24	16	..	..	..	..	..	..	..	..	12	..
20	..	..	..	..	..	24	16	..	..	..	..	..	..	..	..	..	8
21	..	..	..	..	..	24	16	..	..	..	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	24	..	..
23	..	..	..	..	..	..	..	..	..	..	..	30	..	..	18	..	..
24	..	..	..	..	..	..	..	..	..	..	..	..	30	..	24	..	..
25	..	..	..	..	..	..	..	..	..	..	..	..	24	..	24	..	..
26	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	..	..	..	..	..	24	..	13	..	..	..	..	..	..	24	..	..
29	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	..	..	..	..	..	18*	..	13	..	..	..	..	..	..	24	..	..
31	a & b c	..	..	..	..	24	12	..	..	..	..	..	..	..	24	..	..
32		..	..	..	..	24	24	..	..	..	..	..	..	..	24	..	..
33		..	..	..	..	24	36	..	..	..	..	..	..	..	24	..	..
34	a & b c	..	..	..	..	24	..	10	..	..	..	..	..	..	24	..	..
35		..	..	..	..	24	..	20	..	..	..	..	..	..	24	..	..
36		..	..	..	..	24	..	30	..	..	..	..	..	..	24	..	..
35 a	..	..	..	..	..	36	24	..	..	..	..	..	..	..	36	..	..
35 b	..	..	..	..	..	36	..	..	..	90	..	..	..	..	36	..	..
36 a	..	†	..	..	..	36	..	20	..	..	..	..	..	..	36	..	..
36 b	..	..	..	..	..	36	..	20	..	..	..	..	..	..	36	..	..
37 a	..	†	..	..	..	36	..	20	..	..	..	..	..	..	36	..	..
37 b	..	..	..	..	..	36	..	20	..	..	..	..	..	..	36	..	..

* 85 per cent soluble.

† Rolled.

‡ Harrowed.

TABLE IV.—HAY CROP, 1888, 1889, 1890.—*Unmanured Section.*

No. of Plot.	MANURES APPLIED IN 1878, 1879, 1881, 1882, 1883, 1884, AND 1885. (No Manures applied in 1886, 1887, 1888, 1889, and 1890.)	Cwt. per Acre.		
		1888.	1889.	1890.
<i>Phosphatic Manures.</i>				
5	Bone-meal	27	24	24
6	Do. dissolved	28	27	27
7	Phosphatic guano	30	30	27
8	Do. do. dissolved	40	30	24
9	Ground mineral phosphates	21	27	27
10	Do. do. dissolved	31	27	30
11	No phosphates	22	27	25
12	Bone-ash alone	14	21	12
<i>Nitrogenous Manures.</i>				
13	Nitrate of soda	26	27	29
14	Sulphate of ammonia	28	27	24
15	Horn-dust (shoddy 1878)	30	33	30
16	Dried blood	35	39	27
17	No nitrogen	26	30	26
18	Nitrate of soda alone	16	24	20
<i>Potassic Manures.</i>				
19	Sulphate of potash	30	33	27
20	Muriate of potash	25	33	19
21	No potash	16	27	25
22	Potash salts alone	23	27	21
<i>Guanos.</i>				
23	Peruvian guano	22	30	30
24	Fish guano	35	33	18
25	Ichaboe guano	21	24	25
27	Unmanured continuously	9	14	13
<i>Superphosphates.</i>				
28	10% Soluble phosphate	31	24	18
29	25% do. do.	22	21	15
30	40% do. do.	32	30	24

TABLE V.—HAY CROP, 1890.—*Manured Section.*

No. of Plot.	MANURES APPLIED.	SECTION A.	SECTION C.
	<i>Phosphatic Manures.</i>	Cwt. per acre.	Cwt. per acre.
5	Bone-meal	36	30
6	Dissolved bones	42	36
7	Steamed bone-flour	39	33
8	Thomas-slag	39	42
9	Ground mineral phosphates	42	42
10	Superphosphate	39	41
11	No phosphate	43½	..
12	Superphosphate alone	21	..
	<i>Nitrogenous Manures.</i>		
13	Nitrate of soda	38½	38½
14	Sulphate of ammonia	37½	39
15	Horn-dust	34½	28
16	Dried blood	39	40
17	No nitrogen	28	..
18	Nitrate of soda alone	33	..
	<i>Potassic Manures.</i>		
19	Sulphate of potash	42	29
20	Muriate of potash	33	33
21	No potash	36	..
22	Potash salts alone	21	..
	<i>Guanos.</i>		
23	Peruvian (with ammonia)	27	28
24	Fish	30	29
25	Ichaboe	41	39
27	Unmanured continuously	13	..
	<i>Superphosphates.</i>		
28	27 % Soluble phosphate	33	33
30	36 % do. do.	36	36
29	Unmanured, 1889	21	..
	<i>Complementary Manures.</i>		
11c	Phosphate alone	..	24
12c	Nitrogen and potash (no phosphate)	..	34½
17c	Nitrogen alone	..	30
18c	Phosphate and potash (no nitrogen)	..	24
21c	Potash alone	..	24
22c	Phosphate and nitrogen (no potash)	..	31½

TABLE VI.—HAY CROP, 1890. NUMBER OF GRASS PLANTS OF EACH SPECIES (PER CENT).

No. of Plot.	MANURES APPLIED.	Rye-grass.	Cocksfoot.	Timothy.	Dogs-tail.	Fox-tail.	Poa.	Tall and Meadow Fescues.	Hard and Sheep's Fescues.	Holcus.
<i>Phosphatic Manures.</i>										
5	Bone-meal	27.8	4.1	2.6	24.9	...	10.9	...	2.9	26.8
6	Dissolved bones	22.2	5.5	1.1	35.1	...	15.9	1.6	4.7	13.9
7	Steamed bone-flour	33.1	6.1	2.1	26.4	...	8.5	1.4	3.6	18.8
8	Thomas-slag	48.3	6.2	1.3	19.3	...	8.0	...	5.0	12.0
9	Ground mineral phosphate	23.2	6.1	1.1	42.4	...	7.7	1.7	4.4	13.4
10	Superphosphate	42.3	10.2	1.3	20.0	.5	6.8	1.7	5.8	11.4
11	No phosphate	42.5	5.9	2.8	27.8	...	9.0	1.1	5.7	5.2
12	Superphosphate alone	34.6	2.1	.9	43.7	.6	5.4	2.0	6.6	4.1
<i>Nitrogenous Manures.</i>										
13	Nitrate of soda	30.1	5.8	.8	33.3	...	7.9	.9	2.2	19.3
14	Sulphate of ammonia	31.9	5.5	1.6	24.5	...	10.6	1.9	7.7	16.3
15	Horn-dust	29.1	7.1	1.9	38.7	1.0	11.5	3.4	3.8	3.5
16	Dried blood	24.2	10.0	1.7	42.2	.6	10.2	3.9	3.6	3.6
17	No nitrogen	28.4	5.7	.8	40.6	...	9.4	1.5	1.8	11.8
18	Nitrate of soda alone	41.3	4.3	2.1	29.6	...	5.0	1.9	6.3	9.5

Potassic Manures.									
19	Sulphate of potash	} With nitrogen and phosphates.	38.6	8.1	1.9	27.0	...	6.1	.8
20	Muriate of potash		38.1	6.2	.6	43.8	.4	1.0	1.4
21	No potash		44.5	3.9	1.9	26.3	...	4.0	...
22	Potash salts alone		22.5	2.6	1.7	49.2	...	5.7	4.5
Guanos.									
23	Peruvian guano (with ammonia)	34.4	4.0	1.7	33.6	...	4.6	1.6	
24	Fish do.	19.9	4.7	4.8	38.8	...	11.7	2.8	
25	Ichaboe do.	23.7	9.1	4.3	38.6	...	11.5	.4	
27	Unmanured continuously	39.2	2.4	1.0	32.3	...	6.1	3.7	
Superphosphates.									
28	27 per cent superphosphates	} With nitrogen and potash.	35.2	9.7	4.7	30.0	.6	11.1	.9
30	36 per cent do.		34.3	10.5	7.5	29.2	...	4.0	1.2
29	Same as plot 8		46.5	6.3	1.3	23.5	...	5.0	1.8
Complementary Manures.									
11c	Phosphate alone	35.9	5.1	1.8	38.2	...	7.6	2.3	
12c	Nitrogen and potash (no phosphate)	43.6	11.0	2.5	22.0	...	7.8	2.3	
17c	Nitrogen alone	43.4	6.7	1.6	14.5	...	7.7	...	
18c	Phosphate and potash (no nitrogen)	31.6	5.2	.3	27.5	...	3.0	3.8	
21c	Potash alone	27.7	2.1	1.3	45.6	...	5.4	1.8	
22c	Phosphate and nitrogen (no potash)	34.4	9.0	1.6	30.8	...	3.8	1.8	

TABLE VII.—HAY CROP, 1890. BOTANICAL ANALYSIS. WEIGHT OF DIFFERENT SPECIES OF GRASSES (PER CENT).

No. of Plot.	MANURES APPLIED.	Rye-grass, foot.	Timothy.	Dogs-tail.	Fox-tail.	Meadow-grasses.	Tall and Meadow Fescues.	Hard and Sheep's Fescues.	Holcus.	Red Clover and Cow-grass.	Alsike and White Clover.	Weeds.
5	Bone-meal	11.9	18.5	9.3	27.8	3.3	...	.7	26.5	...	1.3	.7
6	Dissolved bones	9.2	24.1	4.0	37.9	4.6	1.9	1.1	13.2	...	2.9	1.1
7	Steamed bone-flour	13.3	25.7	7.1	27.5	2.4	1.7	.8	17.4	.4	3.3	.4
8	Thomas-alag	22.4	30.1	5.1	23.1	2.6	...	1.3	12.8	1.3	1.3	...
9	Ground mineral phosphate	9.2	21.5	5.1	44.1	2.1	2.1	1.0	12.3	.5	2.1	...
10	Superphosphate	15.8	4.0	4.2	19.4	1.8	1.8	1.2	9.7	...	1.8	3.7
11	No phosphate	18.8	27.2	10.3	31.9	2.8	1.4	1.4	5.3	...	.9	...
12	Superphosphate alone	16.4	10.5	3.6	53.7	1.8	2.7	1.8	4.5	...	2.7	1.4
13	Nitrate of soda	12.1	24.3	2.8	34.3	2.2	1.1	.5	17.7	...	5.0	...
14	Sulphate of ammonia	14.0	25.5	5.8	28.0	3.3	2.5	1.9	16.5	...	1.9	.6
15	Horn-dust	11.1	23.5	6.1	38.5	3.1	3.8	.8	3.1	...	3.8	...
16	Dried blood	8.8	36.3	4.9	38.3	.7	3.9	.7	2.9	...	1.0	...
17	No nitrogen	10.8	22.5	2.5	40.0	2.5	1.7	.4	10.4	1.7	6.7	.8
18	Nitrate of soda alone	19.0	21.0	8.1	35.4	1.6	2.4	1.6	10.1	...	.4	.4

<i>Potassic Manures.</i>											
19	Sulphate of potash	} With nitrogen and phosphate.	15.2	33.4	6.2	27.6	...	1.7	.9	.4	...
20	Muriate of potash		15.0	25.7	2.1	44.9	.5	.3	1.6	.3	...
21	No potash		20.3	18.9	7.4	31.1	...	1.3	..	...	.7
22	Potash salts alone .		9.4	11.6	6.0	53.6	...	1.7	5.4	2.2	.9
<i>Guanos.</i>											
23	Peruvian (with ammonia)		14.9	17.6	6.1	37.8	...	1.4	2.0	.6	.6
24	Fish		7.5	18.9	15.2	37.8	...	3.1	3.1	1.2	...
25	Ichaboe		8.0	32.4	12.2	33.8	...	2.7	.4	.4	.4
27	Unmanured continuously		19.9	13.3	4.4	42.6	...	2.2	5.5	2.2	...
<i>Superphosphates.</i>											
28	27 per cent superphosphate	} With nitrogen and potash.	12.6	36.4	14.0	28.0	.7	2.8	1.0	.7	...
30	36 per cent do.		10.9	35.2	20.0	24.2	...	.9	1.2	.9	...
29	Same as plot 8		20.0	28.5	4.6	26.3	...	1.5	2.3	1.5	1.5
<i>Complementary Manures.</i>											
11c	Phosphate alone		14.8	22.2	6.2	40.7	...	2.2	2.8	.6	1.2
12c	Nitrogen and potash (no phosphate)		15.9	41.9	7.5	20.9	...	2.0	2.4	.5	.5
17c	Nitrogen alone		19.0	31.0	6.0	16.6	...	2.4	...	.6	...
18c	Phosphate and potash (no nitrogen)		13.1	22.9	1.2	29.6	...	.9	4.5	1.7	1.4
21c	Potash alone		12.4	10.2	5.1	53.3	...	1.7	2.2	2.2	...
22c	Phosphate and nitrogen (no potash)		12.8	34.5	4.9	29.6	...	1.0	1.9	.5	...

TABLE VIII.—HAY CROP, 1890. WEIGHTS OF DIFFERENT SPECIES (CWTs. PER ACRE).

No. of Plot.	MANURES APPLIED.	Rye-grass.	Cocks-foot.	Timothy.	Dogs-tail.	Fox-tail.	Poa.	Meadow and Tall Fescue.	Hard Sheep's Fescue.	Holcus.	Red Clover and Cow-grass.	Alsike and White Clover.	Weeds.
5	Bone-meal	4.3	6.7	3.3	10.0	...	1.2	...	.3	9.5	...	.5	.2
6	Dissolved bones	3.9	10.1	1.7	15.9	...	1.9	.8	.5	5.5	...	1.2	.5
7	Steamed bone-flour	5.2	10.1	2.8	10.8	...	1.0	.6	.3	6.9	.2	.9	.2
8	Thomas-slag	8.7	11.8	2.0	9.0	...	1.0	...	.5	5.0	.5	.5	...
9	Ground mineral phosphate	3.9	9.0	2.1	18.5	...	.9	.9	.4	5.2	.2	.9	...
10	Superphosphate	6.2	15.6	1.6	7.6	.2*	.7	.7	.5	3.8	...	.7	1.4
11	No phosphate	8.2	11.8	4.5	13.9	...	1.2	.6	.6	2.3	...	.4	...
12	Superphosphate alone	3.4	2.2	.7	11.3	.2	.4	.6	.4	.9	...	.6	.3
13	Nitrate of soda	4.6	9.3	1.1	13.1	...	.8	.4	.2	6.8	...	1.9	...
14	Sulphate of ammonia	5.2	9.6	2.2	10.6	...	1.2	.9	.7	6.2	...	.7	.2
15	Horn-dust	3.8	9.8	2.1	13.3	.4	1.1	1.3	.3	1.1	...	1.3	...
16	Dried blood	3.3	14.1	1.9	15.0	.3	1.0	1.5	.3	1.2	...	.4	...
17	No nitrogen	3.0	6.2	.7	11.0	...	.7	.5	.1*	2.9	.5	1.9	.2
18	Nitrate of soda alone	6.3	6.9	2.7	11.8	...	.5	.8	.5	3.3	...	.1	.1

Potassic Manures.														
19	Sulphate of potash	} With phosphates and nitrogen.	6.4	14.0	2.6	11.5	...	.7	.4	.2	6.0	...	.2	...
20	Muriate of potash		5.0	7.4	.7	14.8	.2	.1	.5	.1	2.1	...	1.1	...
21	No potash		7.3	6.8	2.8	11.1	...	.5	...	...	7.3	...	...	...
22	Potash salts alone		2.0	2.4	1.3	11.2	...	.4	1.1	.5	.7	.1	1.1	.2
Guanos.														
23	Peruvian (with ammonia)		4.0	4.7	1.6	10.3	...	.4	.5	.2	4.7	...	.4	.2
24	Fish		2.2	5.7	4.6	11.4	...	.9	.9	.4	3.0	...	.9	...
25	Ichaboe		3.3	13.3	5.0	13.9	...	1.1	.2	.2	3.3	...	.7	.2
27	Unmanured continuously		2.3	1.5	.5	4.8	...	.2	.6	.2	1.0	...	.1	...
Superphosphates.														
28	27 per cent superphosphates	} With nitrogen and potash.	4.2	12.1	4.6	9.3	.2	.9	.3	.2	1.1	...	.1	...
30	30 per cent do.		3.9	12.8	7.2	8.7	...	.3	.4	.3	2.2	...	.2	...
29	Same as plot 8		4.2	6.0	1.0	5.6	...	.3	.5	.3	1.9	.6	.3	.3
Complementary Manures.														
11c	Phosphate alone		3.6	5.3	1.5	9.8	...	.5	.7	.1	1.5	.3	.4	.3
12c	Nitrogen and potash (no phosphate)		5.5	14.5	2.6	7.2	...	.7	.8	.2	2.4	.2	.2	.2
17c	Nitrogen alone		5.7	9.3	1.8	5.0	...	.7	...	.2	7.1	...	.2	...
18c	Phosphate and potash (no nitrogen)		3.1	5.6	.3	7.1	...	.2	1.1	.4	4.9	.3	.7	.3
21c	Potash alone		3.0	2.4	1.2	12.8	...	.4	.5	.5	1.8	.3	1.1	...
22c	Phosphate and nitrogen (no potash)		4.0	10.9	1.6	9.3	...	.3	.6	.2	4.3	...	.3	...

TABLE IX.—EFFECT OF SOLUBLE NITROGENOUS MANURES ON THE FEEDING QUALITY OF GRASS.

	Nitrate of Soda.					
Per Acre	144 lb.		288 lb.		432 lb.	
Plot	31	32	31	32	31	32
Moisture . . .	11.90	11.70	12.55	12.40	12.40	13.40
Albumen . . .	3.94	3.72	4.37	4.81	4.81	5.25
Amides, &c. . .	1.75	1.97	1.75	1.75	3.06	1.31
Carbohydrates, &c. .	50.11	50.06	50.18	48.99	48.45	48.54
Woody fibre . . .	24.35	23.85	23.40	22.55	21.34	22.10
Ash	7.95	8.70	7.75	9.50	9.95	9.40
	100.00	100.00	100.00	100.00	100.00	100.00
	Sulphate of Ammonia.					
Per Acre	120 lb.		240 lb.		360 lb.	
Plot	33	34	33	34	33	34
Moisture . . .	11.75	12.20	12.60	11.55	12.30	12.85
Albumen . . .	3.50	3.50	3.94	3.94	4.37	4.37
Amides, &c. . .	2.19	2.19	2.18	2.18	2.63	2.63
Carbohydrates, &c. .	50.61	51.16	50.18	50.23	49.55	48.35
Woody fibre . . .	23.60	23.60	23.30	24.84	22.60	24.65
Ash	8.35	7.35	7.80	7.25	8.55	7.15
	100.00	100.00	100.00	100.00	100.00	100.00

FEEDING EXPERIMENTS IN 1889-90.

THE DIGESTIBILITY OF THE TURNIP.

Although turnips form the chief winter fodder of cattle in Scotland, there has been no attempt made, so far as I know, to determine their digestibility—that is to say, the degree in which the various food constituents contained in them are able to be assimilated by cattle so as to contribute directly to their nourishment.

It is common to hear feeders say that turnips are perfectly digestible, by which we may presume they mean that they are a wholesome fodder, not liable to cause indigestion. That, of course, is unquestioned, seeing that stock often get almost nothing else for months together, and thrive on it; but during the time they are feeding on turnips they are regularly voiding solid excrement, consisting of matter which has been eaten as turnip, but which has passed through the stomach and the long course of the intestines without having been digested, and without having contributed in any way whatever to the nourishment of the animal body. The amount of solid excrement is therefore a measure of the indigestible matter of the fodder, or I should rather say, of the undigested matter—for, according to the richness of the fodder and the amount eaten, the solid excrement may contain very considerable quantities of matter, which, though digestible, have nevertheless escaped digestion. The digestibility of a fodder is found by subtracting the food constituents recovered in the dung from those originally contained in the fodder, when healthy animals are selected for experiment, and fed under conditions as nearly normal as possible. There are circumstances affecting the apparent digestibility of fodder which are peculiar to the animals consuming it. Not only do cattle differ from sheep and other animals in their powers of digestion, but among animals of the same species and of the same breed there are notable differences. Some individuals are better feeders than others—that is to say, they are able to extract more nourishment from their fodder, and on that account it is not safe to accept too absolutely the results obtained from experiments made with one animal only. Nevertheless, the most of the data at our command regarding the digestibility of fodders are derived from experiments made with single animals at various agricultural institutes and experimental stations on the Continent. One reason of that is that an experiment of that kind requires a

specially constructed stall, and the exercise of much care and watchfulness on the part of attendants.

The most appropriate place for such an experiment is an experimental station, where the animals are constantly under skilled supervision; but in the absence of such facilities it is still possible for any one to undertake such an investigation who is accustomed to conduct his feeding operations in a scientific manner, and who has a cattleman trained to make accurate observations. It is sufficient guarantee for the reliability of the experiment I am about to describe that it was undertaken by Mr John Milne, at his farm Mains of Laithers. We arranged the plan of operations together, and during a visit which I paid to the farm I had the opportunity of seeing how carefully and accurately the work was carried out.

TABLE I.—COMPOSITION OF SWEDES AND OAT-STRAW.

	Swedes.		Oat-straw.	
		dry.		dry.
Moisture	89.90	...	10.63	...
Albumen	.64	6.31	1.53	1.71
Amides, &c.	.36	3.53	.66	.74
Fat	.10	1.00	1.40	1.56
Carbohydrates	7.33	72.62	50.90	56.96
Woody fibre	1.02	10.13	29.50	33.01
Ash	.65	6.41	5.38	6.02

For the purpose of this experiment a two-year-old Irish-bred roan ox was selected. The stall in which the animal was tied was provided with a sparred floor, underneath which were slid two square zinc trays, fitting the under-floor accurately, and slightly overlapping in the middle. The front tray was so placed as to catch the urine, and the back one to catch the solid excrement, and they answered the purpose very well. The trays were removed daily at a regular hour, and their contents carefully removed and weighed.¹ The ox was weighed every week, and the experiment lasted six weeks—from 18th April till 29th May—not including a preliminary period of a few days during which the animal was becoming accustomed to the stall. The fodder consisted entirely of swedish turnips and oat-straw. The swedes had been early stored, and had

¹ By Alexander Laurence, an experienced and careful cattleman.

kept very well, so that there was comparatively little sprouting, considering the lateness of the season. The oat-straw, owing to the late harvest, contained a considerable mixture of green straw which had not been fully ripened. Their analyses were as given in Table I.

The composition of the swedes was just what that of good average swedes should be, but the oat-straw was quite abnormal. It contained only about half the ordinary amount of albumen; but, on the other hand, it had an extraordinary amount of carbohydrates, and correspondingly little woody fibre.

In Table XI, p. 221, are shown the daily record of the amount of turnips and straw consumed, the amounts of dung and urine voided, and the weight of the ox each week.

TABLE II.—AVERAGE DAILY CONSUMPTION AND EXCRETION OF OX No. 1.

Week.	Turnips.	Straw.	Dung.	Urine.
	lb.	lb.	lb.	lb.
First . . .	110	8	32	55
Second . . .	101	9	37	37
Third . . .	100	10	32	30
Fourth . . .	117	10	38	47
Fifth . . .	112	11	38	41
Sixth . . .	119	9	40	50
Average . . .	110	9½	36	43

During the first week the animal fell off considerably in weight, but remained almost stationary thereafter till the end of the experiment. The turnips were given in definite amount daily, and any residues found at the end of the day were removed and their weight deducted. The quantity consumed daily was fairly regular, but occasionally a day occurred when a drop of 30 or 40 lb. took place, which might or might not be compensated by an increased consumption of straw. The straw was supplied in bundles of 7 lb. at a time, and if at any time the supply was falling short another bundle was added, so that there was always a supply in the heck; but on some occasions residues of straw were removed and their weight deducted. As regards the amount of dung and urine voided, it will be seen that they varied considerably from day to day, but it was in

the amounts of urine that the greatest fluctuations occurred. The amounts voided were least when the quantity of turnips consumed the previous day was small. (See record of 6th and 7th May.)

The average daily consumption and excretions during the six weeks was as given in Table II., p. 205.

These fluctuations in the daily weight of the discharges sufficiently account for the variations up and down in the live-weight of an animal when weighed once a-day or once a-week, or even once a-month. A difference of 20 or 30 lb. on the total defections from day to day is quite common, so that in using the scales to test the progress of a feeding animal, it is quite evident that the weighing of any single day is not to be trusted. An ox which is weighed once a-fortnight, and which is gaining steadily 2 lb. per day of live-weight, ought to show a regular increase of 28 lb., but yet it might have discharged so much during the twenty-four hours before weighing as to seem to be remaining stationary, or even to be going back in condition. Even when weighed on two consecutive days, the average of the two weighings is not trustworthy, but the average of three consecutive daily weighings will usually be found sufficiently reliable.

Four samples of the dung were taken during the course of the experiment, and sent to the laboratory for analysis. The composition of the dung was as follows:—

TABLE III.—ANALYSES OF DUNG OF OX No. 1.

	1	2	3	4
Moisture . . .	86.51	87.18	86.29	85.77
Albumen . . .	1.36	1.46	1.62	1.54
Amides, &c. . .	.38	.17	.15	.25
Fat	.32	.31	.39	.30
Carbohydrates, &c.	6.62	6.45	6.68	6.92
Woody fibre. . .	3.44	2.85	3.18	3.45
Ash	1.37	1.58	1.69	1.79
	100.00	100.00	100.00	100.00

It is seen to be comparatively uniform, and to contain a considerable residue of nutritive matter, quite as much as is

contained in an average sample of the turnips which formed the chief part of the animal's diet.

With these data before us, it is easy to compute the total amount of food constituents consumed and discharged during the whole course of the experiment. This has been done for each day, but it will be sufficient here to give the weekly register (Table XII., p. 222).

Having thus discovered the amounts of the various food constituents that were consumed, and the amounts of those that were discharged in the dung, we have only to subtract the dung constituents from the food constituents in order to see what proportion of each was digested, and then to arrive at a fairly accurate knowledge of the digestibility of the fodder when fed to an ox in good health in the quantities commonly used in the wintering of cattle in this country. If we find from week to week that the digested and undigested matter in each of the constituents have a fairly constant ratio to each other, we have good ground to rely on the accuracy of the results obtained.

It will be seen that upon the whole the proportions of the various constituents of the fodder digested show great uniformity. The only irregularity of any importance occurred during the first week, when, as already explained, the animal lost weight slightly, showing that it had not got into equilibrium with its diet. This is especially seen in the apparent digestibility of the albumen. In making experiments to determine the digestibility of fodder, it is of the first importance that the animal consuming the food should be either remaining stationary or gaining weight in a slow and regular manner, and that it should be accustomed to the conditions under which it is being kept. For this reason I think it would be necessary in this case to discount the first week, and regard it as belonging to the probationary period; but the last five weeks may be accepted as providing reliable information as to the digestibility of the various constituents of the fodder.

But we now come to the main object for which the experiment was undertaken—viz., to test the digestibility of the turnip when forming the chief part of the food of an ox. The figures given above refer to the digestibility of the whole fodder, turnips and straw combined. Before we can say anything about the digestibility of the turnip, we must know what proportion of the digested matter was derived from the oat-straw. This is a matter of some difficulty; for although there have been frequent experiments to determine the digestibility of oat-straw, they are found to exhibit extraordinary diversity. There is perhaps no fodder more liable to fluctuation in feeding quality than oat-straw, unless it be oats themselves. Professor J.

Kühn, in his table of analyses, gives the following as the limits of the percentage composition of oat-straw:—

	Minimum.	Maximum.	Mean.
Albuminoids . . .	1.3	7.0	4.0
Fat . . .	1.0	5.1	2.0
Carbohydrates . . .	24.9	48.9	35.6
Woody fibre . . .	30.0	50.2	39.7

An article of food showing such diversity of composition will also show great differences in digestibility. Experience has shown that according as the albuminoids in a food are abundant their digestibility increases, and *vice versa*. In the case of Mr Milne's straw the albuminoids are nearly a minimum, the woody fibre is less than Kühn's minimum, and the carbohydrates are a maximum. No varieties of oat-straw of this description have ever been used in feeding experiments where digestibility was being determined, so far as I know. Eight such experiments referred to by Professor E. Wolff, in which four varieties of oat-straw were used containing rather more than the mean amount of albuminoids, gave the following range of digestibilities:—

Albuminoids . . .	from 24 to 48 per cent.
Fat . . .	" 20 " 49 "
Carbohydrates . . .	" 39 " 45 "
Woody fibre . . .	" 55 " 64 "

The range of digestibility is seen to be very considerable, and without any actual experiments to determine the point we must select what are fair ratios of digestibility of the constituents of the straw in question. As regards the albumen, it would be of minimum digestibility, seeing that the straw was so poor in that constituent; and if 30 per cent of the albumen from that source is allowed to be digested, we cannot be far off the mark. It might be one or two per cent lower, but certainly not any higher. When we consider, however, that only about one-seventh of the whole albumen consumed by the ox was derived from the straw, it is evident that a unit or two up or down in its digestibility is of no importance. It is very different with the carbohydrates, one-third of which was derived from the straw; and still more so with the woody fibre, two-thirds of which were derived from the straw. A little error in estimating the digestibility of these constituents of the straw would have marked effect upon their apparent digestibility in the turnip. It is quite evident that the digestibility of the straw in the experiments described by Professor Wolff, even at its maximum, is much inferior to that used by Mr Milne. Even if

we were to assume that all the carbohydrates of the turnip were digested, there would be enough digested carbohydrates remaining to constitute 58 per cent of what was contained in the straw. It is evident, then, that 60 per cent is the lowest value that can be given to the digestibility of the carbohydrates of the straw. As regards the woody fibre, it is found to be more digestible than the carbohydrates, and there is good reason to conclude that the woody fibre of this straw was much more digestible than usual. That it was greater than the maximum given by Professor Wolff is evident, for even assuming that the woody fibre of the turnip had been wholly digested, the amount of digested woody fibre during the third week of the experiment could not be accounted for unless there had been at least 66 per cent of the woody fibre of the straw digested also. As to the amides, their digestibility has been reckoned on the assumption that they and other non-albuminoid nitrogenous matters found in the dung were simply an undigested residue of those consumed in the food, which perhaps they were not. The amount of that constituent derived from the straw is so small that the want of accurate data as to its digestibility cannot lead to any appreciable error. We may thus assume the following coefficients of digestibility for the food constituents of Mr Milne's straw:—

	Per cent.
Albumen	30
Amides, &c.	70 (?)
Carbohydrates	60
Woody fibre	66

If we now subtract the digestible matter of the straw from the total digested matter of the fodder, we obtain the following amounts of digested matters derived from the turnips:—

TABLE IV.—AMOUNT OF TURNIP CONSTITUENTS DIGESTED WEEKLY.

	WEEKS.					
	First.	Second.	Third.	Fourth.	Fifth.	Sixth.
	lb.	lb.	lb.	lb.	lb.	lb.
Albumen	2.53	1.39	1.75	1.81	1.71	1.73
Amides, &c.	2.23	2.05	2.24	2.53	2.45	2.60
Carbohydrates	56.16	48.32	50.59	55.77	56.05	56.35
Woody fibre	6.48	5.18	7.04	7.83	7.26	6.11

These being the amounts of the turnip constituents digested each week, we have only to calculate what proportion they bear to the total amounts of these constituents contained in the turnips consumed in order to discover what is the digestibility of the turnips in question when fed in large quantity along with straw, as is the custom in this country.

TABLE V.—PROPORTION OF TURNIP CONSTITUENTS DIGESTED.

	WEEKS.					
	First.	Second.	Third.	Fourth.	Fifth.	Sixth.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Albumen .	49	31	39	35	34	33
Amides, &c. .	80	80	88	87	87	87
Carbohydrates	94	92	98	94	96	91
Woody fibre .	80	71	97	83	91	72

If we neglect the first week, during which the ox had not got into equilibrium with its diet, and take the averages of the weeks which follow, we obtain the following values representing the digestibility of swedish turnips after winter storage when consumed by an ox getting about 1 cwt. per day :—

	Per cent.
Albumen .	35
Amides, &c. .	86 (?)
Carbohydrates	92
Woody fibre	83

It is thus shown that the food constituents of the turnip have, with the exception of the albumen, a high ratio of digestibility ; but as the turnips used in the experiment had been long stored, and had sprouted to some extent, these percentages cannot be regarded as representing the digestibility of turnips when at their best. We determined, therefore, to repeat the experiment under more normal conditions during the ensuing winter.

SECOND EXPERIMENT, OX No. 2.

FIRST PERIOD.

In October a polled ox (No. 2) was selected by Mr Milne, and put into the prepared stall. He was fed throughout November on full turnips (Aberdeen yellows) and oat-straw of the following composition:—

TABLE VI.—COMPOSITION OF YELLOW TURNIPS AND OAT-STRAW.

	Aberdeen Yellow Turnips.		Oat-straw.	
		dry.		dry.
Moisture . . .	92.40	...	18.70	...
Albumen . . .	.66	8.75	1.75	2.15
Amides, &c. . .	.20	2.67	.66	.81
Fat	...	...	1.50	1.84
Carbohydrates, &c.	5.03	66.13	46.14	56.76
Woody fibre . .	.85	11.20	26.50	32.59
Ash	.86	11.25	4.75	5.85
	100.00	100.00	100.00	100.00

The turnips on this occasion contained only 7.6 per cent of solids, instead of 10.1 as on the former occasion; nevertheless the percentage of albumen was even greater than before, so that when the water is subtracted and the composition of the dry matter compared, it is seen that the yellow turnips are a better balanced fodder than the swedes. As to the oat-straw, it is seen to be of the same exceptional character as that used before, but richer in albumen. Owing to the more watery character of the turnip the ox was able to consume larger quantities than its predecessor.

The quantities of fodder consumed and the dung and urine voided during the course of the experiment are shown on Table XIII., p. 223.

The average consumption and excretion per day was as given on Table VII., p. 213.

The discharges in this case weighed fully two-thirds (68 per cent) of the weight of the total food-material consumed,

instead of 66 per cent (the proportion shown in the first experiment), due to the more watery character of the diet.

Two analyses of dung were made during November, on 18th and 28th, and each sample was a mixture of the dung of three consecutive days. They were as follows:—

ANALYSES OF DUNG OF OX No. 2.—FIRST PERIOD.

	Nov. 16 to 18.	Nov. 26 to 28.
Moisture	85.30	85.23
Albumen	1.54	1.61
Amides, &c. . . .	.29	.40
Fat	.73	.70
Carbohydrates, &c. . . .	7.40	7.11
Woody fibre	3.11	3.40
Ash	1.63	1.55
	100.00	100.00

The composition of the dung is seen to be very uniform, and to resemble very closely that obtained in the former experiment.

The exact amount of food constituents consumed and discharged during the five weeks of the experiment, and the total digestibility of the fodder, are shown on Table XIV., p. 224.

If we deduct the digestible matter of the straw we obtain that derived from the turnips. Assuming, as in the former case, that the albumen, amides, carbohydrates, and woody fibre of the straw had a digestibility of 30, 70, 60, and 66 per cent respectively, we obtain the values for the amounts of turnip constituents digested and their ratios of digestibility (see Table VIII., p. 213).

Taking the average of these determinations, we are led to the following values for the digestibility of Aberdeen yellow turnips when given at the rate of about 1 cwt. per day along with about 10 lb. straw:—

DIGESTIBILITY OF TURNIP.

	Per cent.
Albumen	55
Amides, &c.	65 (?)
Carbohydrates	94
Woody fibre	90

The result of these experiments is to show that the food constituents of turnips are not entirely digested, and that especially as regards the albumen not much more than the half is digested under favourable conditions, and that in some circumstances only one-third of it is digested. Whether the low digestibility of the albumen of swedes is a general characteristic of the crop, or whether it was due in this case to deterioration from storage, will form the subject of a future

investigation. It is satisfactory to find that the carbohydrates, which are by far the most important constituent of the turnip

TABLE VII.—AVERAGE DAILY CONSUMPTION AND EXCRETION
OF Ox No. 2.

Week.	Turnips.	Straw.	Dung.	Urine.
	lb.	lb.	lb.	lb.
First . . .	133	10½	34	61
Second . . .	120	9½	29½	58
Third . . .	113	8¾	26½	60
Fourth . . .	117	9½	27	59
Fifth . . .	113	9¼	29	53
Average over whole } period . . .	119	9½	29	58

TABLE VIII.—TURNIP CONSTITUENTS DIGESTED WEEKLY,
AND PERCENTAGE DIGESTED.

	WEEK.				
	First.	Second.	Third.	Fourth.	Fifth.
	lb.	lb.	lb.	lb.	lb.
Albumen . . .	3.1	3.2	3.0	3.2	2.6
Amides, &c. . .	1.3	1.4	1.0	1.0	.9
Carbohydrates . .	42.7	39.6	38.0	40.1	36.6
Woody fibre . . .	7.1	6.9	5.9	6.6	5.3
	per cent.	per cent.	per cent.	per cent.	per cent.
Albumen . . .	50	58	57	59	50
Amides, &c. . .	71	85	62	61	60
Carbohydrates . .	91	94	95	97	91
Woody fibre . . .	88	96	88	95	78

crop, have a very high ratio of digestibility, and that the woody fibre is not far behind it. As to the amides and other non-albu-

minoid nitrogenous substances, they are seen to vary very much both in quantity and in apparent digestibility.

In the swedes about one-third of the nitrogenous matter was of the non-albuminoid kind, and in the yellows about one-fourth part; and here again we are in doubt whether the larger proportion of that constituent found in the swedes was natural to them, or whether it was due to a degradation of the albumen during storage. This also will form the subject of future inquiry. It is highly probable that a considerable conversion of albumen into amides took place during storage; nevertheless I have frequently found as much as half the nitrogenous matter in fresh turnips in a non-albuminoid form.

It is only during the last few years that a clear distinction has been made between the albuminoid and the non-albuminoid nitrogenous matter of fodders. The non-albuminoid substances are of various kinds, but the most important of them are the amides, which are substances on the road to albumen, and which become converted into albumen during the progress of ripening; or they may be substances on the road back from albumen, and which are formed from albumen during the progress of decay. Their value as fodder has received a good deal of attention, but is not yet determined. It has been found by Weiske that in the case of ruminants the amides in food have the effect of conserving the albuminoid matter of the body, and thus in some measure taking the place of albumen; but to what extent they are valuable in that respect when given in the various proportions found in fodders, has not been determined. Apart from their nitrogenous matter, however, they contain carbonaceous matter, which gives them some value as food, and enables them to be classified along with the other non-nitrogenous constituents of fodder.

SECOND PERIOD.—OX (No. 2) FED ON HALF QUANTITY OF TURNIPS.

60 lb. daily.

On the completion of the experiment just described, we resolved to reduce the quantity of turnips stage by stage, and to give in place of them an allowance of linseed-cake, in order to make some contribution to the solution of the problem, so frequently discussed, as to the relative economy of feeding with full turnips, as against half the amount of turnips, or one quarter the amount, or none at all. On December 5th the quantity of yellow turnips was suddenly reduced from 120 lb. to 60 lb. daily, and 3 lb. linseed-cake added; and this was continued for four weeks. The fodder consumed and the dung and urine discharged are seen on Table XV., p. 225.

In the 60 lb. turnips that were withdrawn there would be about $55\frac{1}{2}$ lb. water, and it was thought that the withdrawal of so large a quantity of water from the daily ration would necessitate the providing of some drinking-water, which, it need scarcely be said, was not required when the animal was on full turnips; but although the ox was offered water it did not drink any. It was evident that 60 lb. of turnips contained as much water as the animal required, or more.

A comparison of Table XV. with Table XIII. shows that the chief effect of diminishing the turnips was to cause a tremendous decrease in the quantity of urine voided.

During the four weeks of the experiment the quantities of fodder consumed and discharged daily were:—

TABLE IX.—AVERAGE DAILY CONSUMPTION AND EXCRETION.

Week.	Consumed.			Discharged.	
	Turnips.	Straw.	Cake.	Dung.	Urine.
First	lb. 60	lb. $13\frac{1}{2}$	lb. 3	lb. 29	lb. $16\frac{1}{2}$
Second	60	$14\frac{1}{3}$	3	$29\frac{3}{4}$	$17\frac{1}{2}$
Third	60	$13\frac{1}{3}$	3	$32\frac{1}{4}$	$14\frac{1}{2}$
Fourth	60	$12\frac{1}{3}$	3	32	$12\frac{1}{2}$
Average . .	60	$13\frac{1}{4}$	3	$30\frac{3}{4}$	$15\frac{1}{4}$

The effect of this extraordinary diminution in the flow of urine has a very important bearing not only on the quality of the dung and the amount of litter required to make it, and the accommodation required to store it, but also on the progress of the animal's feeding; for the extra $55\frac{1}{2}$ lb. of water which the animal is compelled to take in its full feed of turnips has to be heated up from a temperature of about 40° Fahr. to upwards of 100° Fahr., and the supply of fuel required to raise the water through that range of temperature has to be got from the animal's food, and an additional amount of heat is absorbed in converting some of it into water vapour, if, on account of the superabundant supply of water, the animal parts with more water in perspiration and respiration.

We thus see that there was a sudden drop of from $58\frac{1}{2}$ lb.

per day of urine down to $16\frac{1}{2}$, and that during the whole four weeks the amount of urine voided was just about one-fourth of that voided during the previous four weeks; but there was practically no difference in the amount of dung excreted. We may now inquire, as we did before, into the total amount of food constituents consumed, rejected, and digested.

Two analyses of dung were made—viz., on the 12th and 26th December. They had the following composition:—

ANALYSES OF DUNG, Ox 2.—SECOND PERIOD.

Moisture	81.24	84.75
Albumen	1.97	1.67
Amides, &c.	.47	.17
Oil	1.07	.85
Carbohydrates	9.01	6.97
Woody fibre	4.30	3.48

They differ from the former samples in having less moisture and more oil. They exhibit greater differences than the former samples; but as the first was taken only one week after the change of diet, the second analysis may be taken as more accurately showing the composition of the dung during this period.

The turnips and straw were of the same kind as those used before, and the cake, which contained about 5 per cent of locust-bean meal, had the following composition:—

ANALYSIS OF OILCAKE.

Moisture	13.67
Albumen	22.31
Amides, &c.	3.72
Oil	12.58
Carbohydrates	32.57
Woody fibre	8.20
Ash	6.95

From these data we obtain the amounts of the various food constituents consumed and discharged, and the amount and proportion digested, weekly (see Table XVI., p. 226).

The notable results are the marked increase in the quantity of albumen digested, which rose from 5 lb. to $5\frac{1}{2}$ lb. per week, and also the increased facility for digesting the albuminoids which the animal acquired during the course of the month. At the beginning of the month 56 per cent of the albumen of the food was digested, and the amount gradually increased till during the last week 61 per cent of the albumen was digested. The oil was digested to a very much greater extent than previously; but it is to be noted that the large increase of oil in the food due to the cake consumed was real oil, and not the nondescript substance extracted from turnips and straw by means of ether;

but what the amount of oil digested really was, it is impossible to say in the circumstances. The substances included under the term amides found in the dung varied a good deal from week to week as usual. The carbohydrates, derived as they were more largely from the straw, were not so well digested as those of the former period; but strange to say, the woody fibre was rather better digested than before.

During the whole course of these experiments samples of urine were sent at short intervals to the laboratory, and the nitrogen contained therein was determined. During the previous month the urine contained .22 per cent of nitrogen, while during this month it contained .56 per cent; but owing to the large amount of urine voided during the previous month the actual amount of nitrogen voided in the urine was .127 lb. per day, while during this month there was lost in that way only .08 lb. of nitrogen per day. We thus see that with a diminished supply of turnips and the addition of cake, the ox was not only absorbing a larger proportion of the albumen of its food, but it was also parting with a smaller proportion of nitrogen in its urine; and the inference to be drawn from that is, that it was retaining more of the albumen of its food within its tissues, and that its increase of live-weight was in greater measure than formerly due to the putting on of flesh. The gain in live-weight during the previous month was 35 lb., while during the present month it was 53 lb.; but the gain of actual beef during this month was greater than is apparent from the increase of live-weight—for owing to the increased quantity of albumen digested, and the smaller quantity wasted, as shown by the diminished amount of nitrogen passed in the urine, it is evident that the animal was becoming firmer in the flesh, and that it was exchanging some of the water of its tissues for beef. The live-weight of an ox is of great assistance to a butcher in enabling him to form a fair estimate of the dead-weight or carcass, which he does by taking into consideration the condition it has attained in fattening. He assists his judgment by handling the animal to gauge as well as possible the firmness of its flesh; but after all, even an experienced butcher is frequently astray in his calculation, unless he knows something of the history of the animal's feeding—for the water contained in the animal's tissues varies much, according to the nature of its food, and it is well known that two oxen, apparently in equally forward condition, when sent on a long journey, as from Aberdeen to London, will lose very unequally in condition during transit. It is evident that during this period the gradual gain in live-weight was accompanied by a gradual exchange of water for solids in the tissues.

The general lessons taught us by the month's results are, that in feeding an ox on a full diet of turnips, 5 or 6 gallons of water more than it requires is caused to pass through the animal's body, and to be discharged through the kidneys; that this increase of water causes an increased amount of albuminoid waste, and prevents the animal from putting on flesh so quickly as it otherwise would do, and that it involves the use of a greatly increased quantity of litter to absorb the urine, which, if it is not completely absorbed, is either allowed to run to waste, which is the usual fate of much of it, or it necessitates the employment of a liquid-manure tank, and in any case very much increases the difficulty and expense of managing the manure.

THIRD PERIOD.—OX (No. 2) FED ON ONE-FOURTH
QUANTITY OF TURNIPS.

30 lb. daily.

On 2d January the third stage was entered upon by reducing the quantity of turnips to 30 lb. daily, and as an equivalent $1\frac{1}{2}$ lb. linseed-cake was added to the animal's diet, along with as much straw and water as it cared to consume. The amounts consumed and discharged during this period are given on Table XVII., p. 227.

During this period a slight increase occurred in the amount of the dung excreted—viz., about 4 lb.; but the amount of urine discharged fell from $15\frac{1}{4}$ lb. to 9 lb. daily. The 30 lb. turnips withdrawn contained $27\frac{3}{4}$ lb. water, but the average amount of water which the animal drank was only $22\frac{1}{2}$ lb. daily, so that the 60 lb. turnips per day consumed during the previous month caused the animal to consume about 5 lb. more water per day than it required.

On Table XVIII., p. 228, are shown the quantities of food constituents consumed and discharged per week, and the extent to which the albumen, carbohydrates, and woody fibre were digested. With the increased quantity of albumen given in the fodder, the ratio of its digestibility increased from 64 to 67 per cent. The carbohydrates and woody fibre, on the other hand, were not quite so well digested as previously, owing doubtless to its being derived in greater measure from straw and cake, and less from turnip.

FOURTH PERIOD.—OX (No. 2) FED WITHOUT TURNIPS.

During the last month the turnips were entirely withdrawn from the daily ration, and $1\frac{1}{2}$ lb. linseed-cake was given in lieu

of them, making the total amount of cake 6 lb. per day. The animal now drank much more water—47 lb. per day on an average, as seen on Table XIX., p. 229, but the amount of straw consumed was if anything rather less than during the previous month, and so also was the amount of dung excreted; but the most notable feature was the very small amount of urine discharged, which on some days fell to 3, 2½, and even 1 lb. in the day.

About 50 lb. of water is thus seen to be the amount which an ox weighing 10 cwt. requires for its daily consumption, and in taking that quantity it discharges only about 7 lb. of urine—less than ¾ gallon. The amount of litter required to absorb that small quantity of urine is very slight, and the only care required is to supply as much litter as will enable the solid excrement to be manufactured into well-rotted farmyard manure.

The amounts of the various food constituents digested are given on Table XX., p. 230, from which it will be seen that the albumen is now still better digested than formerly, and that as regards digestibility the whole of the constituents are nearly on a par.

During the whole course of the experiment the following were the quantities of food constituents consumed per day, the albuminoid ratio of the fodder, and the daily increase in live-weight:—

TABLE X.—Ox No. 2—AVERAGE DAILY CONSUMPTION OF FOOD CONSTITUENTS.

	1st Period.	2d Period.	3d Period.	4th Period.
	lb.	lb.	lb.	lb.
Albumen	.95	1.30	1.50	1.60
Amides, &c.	.30	.30	.30	.30
Oil	.2	.60	.83	.95
Carbohydrates	10.40	10.10	9.50	8.50
Woody fibre	3.50	4.30	4.20	4.20
Total organic matter	15.35	16.60	16.33	15.55
Albuminoid ratio	1 : 8.7	1 : 7	1 : 6.4	1 : 5.7
Gain in live-weight per day .	1 lb.	1.9 lb.	1.28 lb.	1 lb.

The albuminoid ratio is reckoned in the way that has hitherto been customary—that is to say, by taking the amount of the

albuminoids, which consist of the true albumen and the amides reckoned as albumen (as they have been in the above analyses), and finding the ratio of these to the carbohydrates *plus* two and a half times the amount of the oil. It is seen that the albuminoid ratio becomes narrower from period to period, which was practically from month to month in this case; and it might have been expected that the increase in live-weight would have gone on improving as the diet became more concentrated; but experience has shown that, as the fattening process proceeds, the increase in live-weight does not keep pace with the improvement in the quality of the diet, even when the total amount of organic matter contained in the food is steadily maintained, or even increased. As the fattening process goes on, it requires an ever increasing quantity of albumen to enable the animal to lay on a certain quantity of flesh. In this case it is seen that there was a falling off in the quantity of organic matter which the animal consumed during the third and fourth periods, and that its daily increase in live-weight rapidly diminished. It made best progress while consuming 60 lb. of turnips daily; and it is probable that if no diminution had been made in the daily ration of turnips during the third and fourth periods, but only a gradual increase in the amount of cake, it would have gone on adding about two pounds per day to its live-weight. This, however, was not the object we had in view in making the experiment. A daily ration containing only $16\frac{1}{2}$ lb. of organic matter is not sufficient to produce the best feeding results with an animal of its weight; and what prevented it from adding more to its live-weight was its refusal to eat the requisite quantity of food. Had the food been more appetising it would have done so. It is one of the advantages of the turnip, that it is an appetising food; but one disadvantage is that it contains too much water; and it seems indicated by this experiment that the most favourable quantity of turnips to give a feeding animal is that quantity which contains sufficient moisture to supply the animal with all the water it requires, so that it does not require to drink any. It is claimed for various kinds of cattle spice that they serve the purpose of causing an animal to consume in greater quantity fodder which in itself is not sufficiently appetising. Feeding experiments are now in progress to test the value of cattle spices in this respect.

TABLE XI.—DAILY CONSUMPTION AND EXCRETION OF OX No. 1.

	Swedes.	Straw.	Dung.	Urine.	Live-weight.
	lb.	lb.	lb.	lb.	cwt. qr. lb.
April					
17	105	7	38½	38	11 3 9
18	120	7	33	75	
19	120	7	36	51½	
20	120	7	34½	61	
21	80	7	38	52	
22	120	7	17	34	
23	120	7	34	48	
24	120	14	29	61	11 1 0
25	120	14	27	45	
26	105	7	34	34	
27	80	14	36	31	
28	95	7	39½	25	
29	105	7	44½	44½	
30	100	7	41	36	
May					
1	105	7	36½	45	11 1 4
2	105	7	37½	27	
3	105	7	31	36	
4	105	7	42½	40	
5	105	7	37	32½	
6	70	14	27	40	
7	105	14	18½	12	
8	105	14	32	22	11 1 20
9	105	7	36	41	
10	105	14	30	42	
11	105	7	43	44	
12	120	14	41	37	
13	120	12	36	63	
14	120	7	37	44	
15	120	7	42	46	11 2 0
16	120	14	43	33	
17	120	7	47	56	
18	120	7	39	46	
19	80	14	33	39	
20	120	7	28	28	
21	120	14	36	44	11 2 0
22	104	14	42	41	11 1 14
23	108	7	37	36	11 2 7
24	116	14	40	49	
25	114	7	40	44½	
26	110	8	36	39	
27	130	7	44	48½	
28	130	7	41	54	
29	126	14	41	68½	11 2 0

TABLE XII.—FOOD CONSTITUENTS CONSUMED AND DISCHARGED BY
Ox No. 1 WEEKLY.

	Turnips.	Straw.	Dung.	Digested.	Digested.
	lb.	lb.	lb.	lb.	per cent.
<i>April 18 to 24.</i>					
Albumen . .	5.13	.87	3.21	2.79	49
Amides, &c. .	2.74	.39	.62	...	...
Oil	.80	.79	.71	...	...
Carbohydrates .	59.46	28.49	14.70	73.25	83
Woody fibre .	8.14	16.49	7.27	17.36	70
<i>April 25 to May 1.</i>					
Albumen . .	4.54	.97	3.83	1.68	31
Amides, &c. .	2.56	.43	.64	...	...
Oil	.71	.90	.83	...	...
Carbohydrates .	52.41	32.06	17.18	67.56	80
Woody fibre .	7.24	18.56	8.37	17.43	70
<i>May 2 to 8.</i>					
Albumen . .	4.47	1.07	3.47	2.07	37
Amides, &c. .	2.53	.47	.43	...	...
Oil	.70	1.00	.74	...	...
Carbohydrates .	51.40	35.63	15.06	71.97	83
Woody fibre .	7.13	20.63	7.10	20.66	70
<i>May 9 to 15.</i>					
Albumen . .	5.16	1.04	4.08	2.12	34
Amides, &c. .	2.89	.46	.50	...	...
Oil	.80	.97	.87	...	...
Carbohydrates .	59.62	24.61	17.69	76.54	81
Woody fibre .	9.36	20.04	8.34	21.06	70
<i>May 16 to 22.</i>					
Albumen . .	5.02	1.17	4.13	2.06	33
Amides, &c. .	2.81	.51	.51	...	...
Oil	.78	1.00	.88	...	...
Carbohydrates .	58.27	39.20	17.90	79.57	81
Woody fibre .	7.98	22.70	8.44	22.24	72
<i>May 22 to 29.</i>					
Albumen . .	5.33	.98	4.29	2.02	32
Amides, &c. .	3.00	.43	.53	...	...
Oil	.83	.91	.92	...	...
Carbohydrates .	61.96	32.57	18.64	75.89	80
Woody fibre .	8.50	18.86	8.80	18.56	68

TABLE XIII.—DAILY CONSUMPTION AND EXCRETION OF Ox No. 2.

	Turnips.	Straw.	Dung.	Urine.	Live-weight.
	lb.	lb.	lb.	lb.	cwt. qr. lb.
Oct. 31	98	12	35	28	8 2 21
Nov. 1	132	12	38 $\frac{1}{4}$	48	
2	140	16	33 $\frac{1}{2}$	42	
3	150	9	35	81	
4	151	10	30 $\frac{1}{2}$	88	
5	140	8	36 $\frac{1}{2}$	72 $\frac{1}{2}$	
6	120	6	29 $\frac{1}{2}$	67 $\frac{1}{4}$	8 3 0
7	120	13	24	62 $\frac{3}{4}$	
8	120	11 $\frac{1}{2}$	25 $\frac{1}{2}$	64 $\frac{1}{2}$	
9	120	9	33	45	
10	120	9	33	54 $\frac{1}{4}$	
11	120	7	31 $\frac{1}{4}$	59 $\frac{3}{8}$	
12	120	9	28 $\frac{1}{2}$	59 $\frac{3}{4}$	
13	120	9 $\frac{1}{2}$	30 $\frac{1}{4}$	59 $\frac{1}{4}$	8 3 7
14	107	8 $\frac{1}{4}$	25 $\frac{1}{4}$	63 $\frac{1}{2}$	
15	116 $\frac{1}{2}$	11 $\frac{3}{4}$	24	51	
16	120	10	30 $\frac{1}{2}$	50 $\frac{3}{4}$	
17	120	8 $\frac{1}{2}$	25 $\frac{1}{8}$	72 $\frac{1}{2}$	
18	120	11	26 $\frac{3}{4}$	67 $\frac{3}{4}$	
19	120	7 $\frac{1}{2}$	25 $\frac{1}{4}$	61 $\frac{1}{4}$	
20	90	4 $\frac{1}{4}$	28	51	8 2 16
21	102	12 $\frac{1}{2}$	16 $\frac{1}{2}$	52	
22	120	10	26	48	
23	116	12	26 $\frac{1}{2}$	54	
24	120	8 $\frac{1}{2}$	30 $\frac{3}{4}$	67	
25	120	8	30 $\frac{3}{4}$	62 $\frac{1}{4}$	
26	120	7	34	60 $\frac{3}{8}$	
27	120	9	23	67 $\frac{1}{2}$	9 0 0
28	110	11 $\frac{1}{4}$	28	63	
29	97	9 $\frac{3}{8}$	31 $\frac{1}{2}$	48	
30	114	10 $\frac{3}{8}$	27	41 $\frac{1}{4}$	
Dec. 1	120	8	33	57	
2	120	6	32	59	
3	120	8 $\frac{1}{2}$	21	54 $\frac{1}{2}$	
4	113	10 $\frac{1}{2}$	29 $\frac{3}{4}$	45 $\frac{3}{4}$	9 0 0

TABLE XIV.--FOOD CONSTITUENTS CONSUMED AND DISCHARGED BY
OX No. 2 WEEKLY.

NOVEMBER.

	Turnips.	Straw.	Dung.	Digested.	Digested.
<i>Oct. 31 to Nov. 6.</i>	lb.	lb.	lb.	lb.	per cent.
Albumen . .	6.14	1.27	3.67	3.74	50
Amides, &c. .	1.86	.48	.69	...	...
Oil	.93	1.09	1.73	...	...
Carbohydrates .	46.83	33.68	17.63	62.88	78
Woody fibre .	7.91	19.34	7.41	19.84	70
<i>Nov. 7 to 13.</i>					
Albumen . .	5.54	1.20	3.16	3.58	53
Amides, &c. .	1.68	.45	.40	...	...
Oil	.84	1.02	1.50	...	...
Carbohydrates .	42.25	31.37	15.20	58.41	80
Woody fibre .	7.14	18.02	6.39	18.77	74
<i>Nov. 14 to 20.</i>					
Albumen . .	5.24	1.07	3.00	3.32	50
Amides, &c. .	1.59	.40	.74	...	...
Oil	.79	.92	1.30	...	...
Carbohydrates .	39.91	28.26	13.21	54.96	80
Woody fibre .	6.74	16.22	6.31	16.65	70
<i>Nov. 21 to 27.</i>					
Albumen . .	5.40	1.17	3.02	3.55	54
Amides, &c. .	1.64	.44	.75	...	...
Oil	.82	1.00	1.31	...	...
Carbohydrates .	41.14	30.91	13.33	58.62	80
Woody fibre .	6.95	17.75	6.37	17.33	70
<i>Nov. 27 to Dec. 2.</i>					
Albumen . .	5.24	1.11	3.42	2.93	46
Amides, &c. .	1.59	.42	.85	...	...
Oil	.80	.95	1.49	...	...
Carbohydrates .	39.94	29.35	15.11	54.18	78
Woody fibre .	6.75	16.80	7.22	16.33	70

The amounts of oil and amides, &c., digested, and their digestibility, are not reckoned from the results contained in this and the previous table, for the amounts of these substances contained in the dung are not necessarily derived directly from the oil and amides contained in the fodder.

TABLE XV.—FEEDING RESULTS ON POLLED OX TWO YEARS OLD
AT 21ST FEBRUARY 1891.

	Yellow Turnips.	Straw and Chaff.	Linseed- cake.	Dung.	Urine.	Live- weight.
1890 Dec. 5	lb. 60	lb. 11	lb. 3	lb. 26 $\frac{3}{4}$	lb. 20 $\frac{1}{2}$	cwt. qr. lb. 9 0 0
6	60	13	3	26 $\frac{1}{4}$	17	
7	60	14 $\frac{1}{2}$	3	28 $\frac{1}{2}$	17 $\frac{3}{4}$	
8	60	15	3	29 $\frac{1}{2}$	19 $\frac{3}{4}$	
9	60	14	3	28	19	
10	60	14 $\frac{1}{2}$	3	35	10	
11	60	13	3	29 $\frac{1}{2}$	11	9 0 4
12	60	11 $\frac{1}{2}$	3	29 $\frac{1}{2}$	23	
13	60	17	3	26	27 $\frac{1}{2}$	
14	60	13	3	26 $\frac{1}{2}$	14	
15	60	15	3	32	13	
16	60	13	3	32 $\frac{1}{4}$	14	
17	60	14	3	30 $\frac{1}{2}$	19	
18	60	13	3	31 $\frac{1}{2}$	12 $\frac{1}{2}$	9 0 21
19	60	14 $\frac{3}{4}$	3	32	13 $\frac{3}{4}$	
20	60	13 $\frac{3}{4}$	3	33 $\frac{1}{2}$	10	
21	60	12	3	31 $\frac{1}{4}$	17	
22	60	13	3	34 $\frac{1}{4}$	13 $\frac{1}{4}$	
23	60	14	3	30 $\frac{1}{2}$	19	
24	60	13	3	32 $\frac{1}{2}$	16 $\frac{1}{4}$	
25	60	13	3	31 $\frac{1}{4}$	13	9 1 21
26	60	12 $\frac{1}{2}$	3	32	10	
27	60	10	3	33 $\frac{1}{4}$	14	
28	60	12	3	35 $\frac{1}{4}$	15 $\frac{1}{4}$	
29	60	14	3	33	12	
30	60	14	3	29	10	
31 1891 Jan. 1	60	11 $\frac{1}{2}$	3	31 $\frac{1}{2}$	15 $\frac{1}{2}$	
28 days' average	} 60	13 $\frac{1}{4}$	3	30 $\frac{3}{4}$	15 $\frac{1}{4}$	9 1 25

TABLE XVI.—FOOD CONSTITUENTS CONSUMED AND DISCHARGED
WEEKLY BY OX NO. 2.

DECEMBER 1890.

	Turnips.	Straw.	Cake.	Dung.	Digested.	Digested.
	lb.	lb.	lb.	lb.	lb.	per cent.
<i>Dec. 5 to 12.</i>						56
Albumen .	2.77	1.66	4.69	4.01	5.11	
Amides, &c. .	.84	.63	.78	.96	...	...
Oil . . .	.40	1.43	2.64	2.18	...	...
Carbohydrates	21.13	43.83	6.84	18.34	53.46	74
Woody fibre .	3.57	25.17	1.72	8.75	21.89	72
<i>Dec. 12 to 18.</i>						
Albumen .	2.77	1.69	4.69	3.78	5.37	58
Amides, &c. .	.84	.64	.78	.67	...	...
Oil . . .	.40	1.45	2.64	2.00	...	...
Carbohydrates	21.13	44.52	6.84	16.62	55.87	77
Woody fibre .	3.57	25.75	1.72	8.09	22.95	74
<i>Dec. 19 to 25.</i>						
Albumen .	2.77	1.64	4.69	3.76	5.34	59
Amides, &c. .	.84	.62	.78	.38	...	...
Oil . . .	.40	1.40	2.64	1.91	...	...
Carbohydrates	21.13	43.13	6.84	15.68	55.43	78
Woody fibre .	3.57	24.78	1.72	7.83	22.14	74
<i>Dec. 26 to Jan. 1.</i>						
Albumen .	2.77	1.52	4.69	3.36	5.52	61
Amides, &c. .	.84	.57	.78	.58	...	...
Oil . . .	.40	1.30	2.64	2.09	...	...
Carbohydrates	21.13	40.03	6.84	15.95	52.05	77
Woody fibre .	3.57	22.98	1.72	7.86	20.41	72

TABLE XVII.—FEEDING RESULTS ON POLLED OX, 1891.

	Yellow Turnips.	Straw and Chaff.	Linseed- cake	Water.	Dung.	Urine.	Live-weight.
1891 Jan.	lb.	lb.	lb.	lb.	lb.	lb.	cwt. qr. lb.
2	30	12 $\frac{1}{4}$	4 $\frac{1}{2}$	20	32	13 $\frac{1}{4}$	9 1 25
3	30	13 $\frac{1}{2}$	4 $\frac{1}{2}$	...	35	6 $\frac{3}{4}$	
4	30	15	4 $\frac{1}{2}$	26	34 $\frac{1}{4}$	6 $\frac{3}{4}$	
5	30	18	4 $\frac{1}{2}$	25 $\frac{1}{2}$	33 $\frac{1}{2}$	9 $\frac{1}{4}$	
6	30	14	4 $\frac{1}{2}$	25	35 $\frac{1}{2}$	5 $\frac{1}{4}$	
7	30	16 $\frac{1}{2}$	4 $\frac{1}{2}$	21	32	10 $\frac{3}{4}$	
8	30	15	4 $\frac{1}{2}$	17	34 $\frac{3}{4}$	10	9 2 0
9	30	12 $\frac{3}{4}$	4 $\frac{1}{2}$	14 $\frac{3}{4}$	32	9 $\frac{1}{2}$	
10	30	15 $\frac{1}{4}$	4 $\frac{1}{2}$	23 $\frac{1}{2}$	35	7	
11	30	15	4 $\frac{1}{2}$	24	35 $\frac{1}{2}$	6 $\frac{1}{2}$	
12	30	12 $\frac{1}{2}$	4 $\frac{1}{2}$	25 $\frac{1}{2}$	34	5 $\frac{1}{2}$	
13	30	14 $\frac{1}{2}$	4 $\frac{1}{2}$	27	35	9 $\frac{1}{4}$	
14	30	12	4 $\frac{1}{2}$	17	31	10 $\frac{1}{2}$	
15	30	11	4 $\frac{1}{2}$	28	36	15	9 1 21
16	30	17 $\frac{3}{4}$	4 $\frac{1}{2}$	27	31	7 $\frac{1}{2}$	
17	30	14	4 $\frac{1}{2}$	30 $\frac{1}{4}$	36 $\frac{3}{4}$	7 $\frac{1}{2}$	
18	30	16 $\frac{1}{4}$	4 $\frac{1}{2}$	17 $\frac{1}{2}$	40	8	
19	30	12 $\frac{1}{2}$	4 $\frac{1}{2}$	31	33	11 $\frac{1}{4}$	
20	30	16 $\frac{1}{4}$	4 $\frac{1}{2}$	25	33	7	
21	30	15 $\frac{1}{2}$	4 $\frac{1}{2}$	31	36	7	
22	30	11 $\frac{3}{4}$	4 $\frac{1}{2}$	20	37	6 $\frac{3}{4}$	9 3 0
23	30	13 $\frac{1}{2}$	4 $\frac{1}{2}$	21	33 $\frac{3}{4}$	15	
24	30	14	4 $\frac{1}{2}$	25	38	9	
25	30	15 $\frac{1}{2}$	4 $\frac{1}{2}$	15	37	10	
24 days' average	30	14 $\frac{1}{2}$	4 $\frac{1}{2}$	22 $\frac{1}{2}$	34 $\frac{1}{2}$	9	

TABLE XVIII.—FOOD CONSTITUENTS CONSUMED AND DISCHARGED
WEEKLY BY OX No. 2.

JANUARY 1891.

	Turnips.	Straw.	Cake.	Dung.	Digested.	Digested.
	lb.	lb.	lb.	lb.	lb.	per cent.
<i>Jan. 2 to 8.</i>						
Albumen .	1.38	1.83	7.03	3.48	6.76	66
Amides, &c. .	.42	.70	1.17	.88	...	...
Oil . . .	.20	1.57	3.96	2.63	...	...
Carbohydrates	10.56	49.02	10.24	18.82	51.00	73
Woody fibre .	1.78	27.69	2.58	9.22	22.73	71
<i>Jan. 9 to 15.</i>						
Albumen .	1.38	1.63	7.03	3.51	6.53	65
Amides, &c. .	.42	.61	1.17	.88	...	...
Oil . . .	.20	1.40	3.96	2.65	...	...
Carbohydrates	10.56	42.91	10.24	18.93	44.78	70
Woody fibre .	1.78	24.64	2.58	9.27	19.73	68
<i>Jan. 16 to 22.</i>						
Albumen .	1.38	1.81	7.03	3.63	6.59	64
Amides, &c. .	.42	.68	1.17	.91	...	...
Oil . . .	.20	1.56	3.96	2.74	...	...
Carbohydrates	10.56	47.87	10.24	19.62	49.05	71
Woody fibre .	1.78	27.49	2.58	9.60	22.25	70

TABLE XIX.—FEEDING RESULTS ON POLLED OX, 1891.

	Straw and Chaff.	Linseed- cake.	Water.	Dung.	Urine.	Live-weight.
	lb.	lb.	lb.	lb.	lb.	cwt. qr. lb.
1891. Jan. 30	12	6	32	31 $\frac{3}{4}$	6	
31	13 $\frac{1}{2}$	6	47	34 $\frac{1}{4}$	8	
Feb. 1	13 $\frac{1}{2}$	6	47 $\frac{1}{2}$	33 $\frac{1}{2}$	4	
2	9 $\frac{3}{4}$	6	38 $\frac{3}{4}$	33 $\frac{3}{4}$	8	
3	19 $\frac{1}{2}$	6	50 $\frac{3}{4}$	32	10	
4	13 $\frac{1}{2}$	6	54 $\frac{1}{2}$	34 $\frac{1}{2}$	11	
5	16 $\frac{1}{2}$	6	54	33 $\frac{3}{4}$	11	9 3 14
6	11 $\frac{1}{2}$	6	31 $\frac{1}{2}$	35 $\frac{1}{2}$	9 $\frac{1}{2}$	
7	17	6	52	37	5	
8	11 $\frac{1}{2}$	6	47	36	4 $\frac{1}{2}$	
9	10	6	33	32 $\frac{1}{4}$	6 $\frac{3}{4}$	
10	14 $\frac{1}{2}$	6	62	30	6 $\frac{1}{2}$	
11	17 $\frac{1}{2}$	6	49 $\frac{1}{2}$	37 $\frac{1}{2}$	3 $\frac{1}{2}$	
12	15	6	56 $\frac{1}{2}$	34	3	10 0 0
13	11 $\frac{1}{2}$	6	25	40	3	
14	15	6	58	30	6 $\frac{1}{2}$	
15	14 $\frac{1}{2}$	6	31	32 $\frac{3}{4}$	2 $\frac{1}{2}$	
16	16 $\frac{1}{2}$	6	59	34	5 $\frac{1}{2}$	
17	15	6	49	32	8 $\frac{3}{4}$	
18	14	6	56 $\frac{1}{2}$	35 $\frac{3}{4}$	10 $\frac{1}{4}$	
19	15	6	32	36 $\frac{1}{4}$	18 $\frac{1}{2}$	
20	14	6	59	36	1	
21	13 $\frac{1}{2}$	6	45 $\frac{1}{2}$	32 $\frac{1}{4}$	5	
22	15	6	48	36 $\frac{1}{2}$	6 $\frac{3}{4}$	
23	13	6	48	36 $\frac{1}{4}$	7	10 0 0
25 days' average	14	6	47	34	7	

TABLE XX.—FOOD CONSTITUENTS CONSUMED AND DISCHARGED
WEEKLY BY Ox No. 2.

FEBRUARY 1891.

	Straw.	Cake.	Dung.	Digested.	Digested.
	lb.	lb.	lb.	lb.	per cent.
<i>Jan. 30 to Feb. 5.</i>					
Albumen . . .	1.73	9.37	3.43	7.67	69
Amides, &c. . .	.65	1.56	.86	...	...
Oil	1.47	5.28	2.59	...	...
Carbohydrates . .	45.33	13.65	18.56	40.42	68
Woody fibre . .	26.03	3.44	9.08	20.39	69
<i>Feb. 6 to 12. .</i>					
Albumen . . .	1.70	9.37	3.56	7.51	67
Amides, &c. . .	.64	1.56	.90	...	...
Oil	1.45	5.28	2.69	...	...
Carbohydrates . .	44.76	13.65	19.24	39.17	67
Woody fibre . .	25.70	3.44	9.41	19.73	67
<i>Feb. 13 to 19.</i>					
Albumen . . .	1.77	9.37	3.54	7.60	68
Amides, &c. . .	.67	1.56	.89	...	...
Oil	1.52	5.28	2.67	...	...
Carbohydrates . .	46.83	13.56	19.14	41.34	68
Woody fibre . .	26.90	3.44	9.37	20.97	68

DIGESTIBILITY OF ENSILAGE.

There was the remainder of a small pit of silage, made chiefly of cocksfoot, in the neighbourhood of Mains of Laithers, and after the first experiment, described on pp. 203 to 210, was over, the Irish roan ox (No. 1) was fed on it. It was made in a pit lined with boards and covered with earth, where it had been stored for many months. Two analyses were made of it, as the character of the second week's supply differed from that of the first, owing to rapid deterioration during the warm weather, which had just set in. But for that circumstance, the experiment would have been continued for another week or more.

TABLE I.—ANALYSIS OF ENSILAGE.

	FIRST WEEK.		SECOND WEEK.	
	Wet.	Dry.	Wet.	Dry.
Moisture	69.30	...	68.40	...
Albumen	3.29	10.72	2.70	8.53
Amides, &c. . . .	1.01	3.28	.76	2.41
Oil	.41	1.35	.66	2.10
Carbohydrates . . .	16.92	55.12	16.99	53.77
Woody fibre	6.81	22.18	7.95	25.15
Ash	2.26	7.35	2.54	8.04
	100.00	100.00	100.00	100.00

Considering the kind of grass from which it was made, these must be regarded as good samples of silage. After a preliminary period of a week, and when the animal had got accustomed to its diet, the following observations were made of the silage consumed and the dung and urine voided:—

TABLE II.—Ox No. 1—SILAGE CONSUMED AND DUNG AND URINE VOIDED.

June.	Silage.	Dung.	Urine.	Weight of Ox.		
				cwt.	qr.	lb.
7	43	35	15	11	2	19
8	33½	32	12½	...		
9	46	32	22½	...		
10	54	30	18	...		
11	58	30½	13	11	2	7
12	58	37	26	11	2	14
13	42	33	29	11	2	9
14	47	41	16	...		
15	47	31½	27½	...		
16	41	32	16½	...		
17	54	37	17	...		
18	54	37½	11½	11	1	14
19	51	36½	16½	11	1	25
20	53	39	15½	11	1	19
Average	50	35	18	...		

Samples of dung were collected on the 11th, 12th, and 13th, and also on 19th, 20th, and 21st of June, and analysed (see Table III.) The average of the first three refers chiefly to the first sample of silage, and that of the second three to the second sample, and they show very little variation. Applying these analyses to the quantities of silage consumed and of dung voided, we obtain the results in Table IV. The general result of this experiment is, that in the case of silage chiefly derived from cocksfoot, less than half of the albumen is digested, and about two-thirds of the carbohydrates and of the woody fibre.

TABLE III.—ANALYSIS OF DUNG OF SILAGE-FED OX.

June . . .	11th.	12th.	13th.	19th.	20th.	21st.
Moisture . .	81.58	82.4	83.7	84.4	82.4	82.1
Albumen . .	2.9	2.5	2.0	2.1	2.5	2.7
Amides, &c. .	.6	.5	.5	.5	.6	.5
Oil . . .	.9	1.0	1.0	.6	.8	.8
Carbohydrates .	8.7	8.2	8.9	7.6	8.5	8.7
Woody fibre .	3.1	3.2	3.2	3.0	3.4	3.4
Ash . . .	2.3	2.2	1.7	1.8	1.8	1.8
	100.00	100.00	100.00	100.00	100.00	100.00

TABLE IV.—FOOD CONSTITUENTS CONSUMED AND DISCHARGED,
Ox No. 1.

	In Silage consumed.	In Dung voided.	Digested.	Digested.
FIRST WEEK.	lb.	lb.	lb.	per cent.
Albumen	11.03	6.00	5.03	46
Amides, &c. . . .	3.36	1.25	...	...
Oil	1.37	2.38	...	...
Carbohydrates . . .	56.76	20.62	36.14	60
Woody fibre	22.85	7.58	15.25	66
SECOND WEEK.				
Albumen	12.83	7.50	5.33	41
Amides, &c.	3.89	1.61	...	...
Oil	1.59	2.21	...	...
Carbohydrates . . .	65.72	23.86	41.86	63
Woody fibre	26.65	9.43	17.12	65

As to the oil, a greater amount of it was discharged in the dung than was eaten in the food. For some reason the percentage of oil in the dung and the total amount voided suddenly increased when the fodder changed from turnips and straw to silage. A certain amount of fat is natural to dung, and derived from the intestines; but in this case the amount was so much augmented that it would seem as if none of what is called oil in the silage had been absorbed. Under the name oil is included everything that is extracted from the silage by ether; but this does not necessarily consist of oil: it consists largely of chlorophyll. The weight of the ox at the end of the fortnight was 28 lb. less than at the beginning. But this does not necessarily imply that it had lost that amount of flesh; for the quantity of food consumed daily was very much decreased—viz., about 15 lb. organic matter per day as against $19\frac{1}{2}$ while feeding on turnips and straw, and the contents of the stomach and alimentary canal were no doubt much diminished.

We have no means of knowing from direct experiment what was the digestibility of the grass from which the silage was made; but in the case of good grass the albumen should be digested to the extent of 60 per cent or so. But on the other hand, the woody fibre is probably better digested in silage than in grass, and still better digested than in hay.

The experiment above described was an afterthought, prompted by the accident of the presence of a small residue of silage in the possession of Mr Stuart of Laithers, who kindly put it at our disposal. Nothing more is claimed for it than that it shows the digestibility of a certain sample of silage after long keeping, and whose chemical composition is known. The results do not entitle us to draw general conclusions regarding the general digestibility of silage, nor its merits as a fodder in comparison with turnip and oat-straw.

AGRICULTURAL EXPERIMENTS BY LOCAL SOCIETIES.

EXPERIMENT VIII.—THE MOST EFFICIENT AND
INEXPENSIVE TURNIP MANURE.

A large number of experiments were tried by local societies throughout the country last year to discover the cheapest and best kind of turnip manure. Owing to the experiments of the two preceding years the question had become considerably narrowed. It had been shown most conclusively that the dearer kinds of phosphate had no advantage over the cheaper kinds, but that in fact the cheapest kinds were also the most efficient. Accordingly in 1890 the experiment became narrowed down to a competition between three kinds of phosphate—viz., steamed bone-flour, superphosphate, and Thomas-slag. These all agree in being very finely ground manures, for experience has shown everywhere that coarsely ground manures cannot compete successfully with finely ground ones; and there is no exception to the rule. They differ from each other in their solubility. Superphosphate is soluble in water, while the other two are not; but nevertheless they are easily capable of being dissolved by various solvents in the soil, and experience shows that though they do not dissolve so quickly and come into operation so soon as superphosphate, yet they are dissolved in time to be useful for the growth of the turnip crop.

The experience of the former year had shown that none of the three were absolutely better than the others, but that much depended on the kind of soil. On heavy land superphosphate on the whole did best, but on the lighter lands sometimes one was better and sometimes another, according to circumstances.

Another question was conjoined with this—viz., What is the proportion of soluble nitrogenous matter that is most appropriate in a turnip manure? Former experiments had shown that the proportion was much smaller than was customarily employed, and that a good deal of money was needlessly spent on that most expensive constituent.

The practical form which the experiment took was as follows:—

Plot.	Quantities of Manure per Acre.				Cost per Acre.	
					Cwt.	s.
1.	Steamed bone-flour	.	.	.	2	18
	Nitrate of soda	.	.	.	$\frac{1}{2}$	
2.	Superphosphate	.	.	.	3	15
	Nitrate of soda	.	.	.	$\frac{1}{2}$	
3.	Thomas-slag	.	.	.	4	12
	Nitrate of soda	.	.	.	$\frac{1}{2}$	
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Plot.	Quantities of Manure per Acre.				Cost per Acre.	
					Cwt.	s.
4.	Mixed phosphates	.	.	.	3	15
	Nitrate of soda	.	.	.	$\frac{1}{2}$	
5.	Mixed phosphates	.	.	.	3	17
	Nitrate of soda	.	.	.	$\frac{3}{4}$	
6.	Mixed phosphates	.	.	.	3	20
	Nitrate of soda	.	.	.	1	
7.	Mixed phosphates	.	.	.	3	11
8.	Nothing	.	.	.	...	...

The cost of the complete manures ranges from 11s. to 20s. per acre—a moderate outlay on manure for a turnip crop; but there are two reasons why the quantity was kept down to that low price: first, because in experimenting it is necessary to keep far within the maximum crop, otherwise distinctions due to manuring are obliterated; and secondly, it was thought a useful thing to show to farmers who are accustomed to spend three times as much money on turnip manures as is necessary, that a smaller outlay, if properly expended, might be more remunerative.

The first three plots are simply a competition between the three kinds of phosphate in what were considered fairly relative quantities. In another set of experiments with the same manures a basis of equal cost per acre was adopted, but the above is what a farmer would consider a rational comparison.

The second three plots are devoted to the second question, What amount of nitrate to phosphate is most appropriate? The phosphates were the same in each—viz., the quantities of Nos. 1, 2, and 3 mixed together and divided into three equal parts.

A mixture of such phosphates may easily be more suitable than any one separately, and therefore plot 4 is capable of being compared with the first three.

It is unnecessary to describe the method in which these tests were carried out by the different associations. It is sufficient to observe that they were under the care and supervision of a committee in each district, and that only such reports as are considered reliable are sent in for publication. In most cases the committee in charge of the experiment or some of them selected the ground, superintended the application of manures, visited the plots during the growing season, and checked the weighing of the crop.

In addition to the results contained in this paper, the experimenters, with few exceptions, supplied careful notes of their observations, and details of various kinds, which would form very instructive reading, especially to those in the districts to which the notes referred; but the limits of space will not permit of their being noticed in this report.

STRATHBOGIE FARMERS' CLUB.

Experimenters.

Mr WILLIAM SCOTT, Corsiestone.
 Mr JOHN DUNCAN, Dowmin.
 Mr ROBERT MILNE, Corse of Kinnoir.
 Mr JAMES WILSON, Arnhall.
 Mr JAMES MERSON, Craigwillie.
 Mr WILLIAM WILSON, Coynachie.
 Mr JOHN SCOTT, Nether Brunstane.
 Mr ALEX. CRAN, Mosshead.
 Mr PETER HENDRY, Hillockhead.

The experiments were under the chief supervision of the secretary, Mr Andrew Cruickshank, who was present at the weighing of all the crops, and took careful notes of all that was done.

The tests were carefully made on all these farms, but only the first five are regarded as quite satisfactory. At Nether Brunstane, where the soil is heavy clay, a fine tilth could not be got, and the plants brairded very unequally. At Mosshead finger-and-toe made its appearance, and although it seemed to affect all the plots equally and not to be aggravated by one kind of manure more than by another, it is better to err on the side of safety and exclude the results from the report. At Hillockhead the plots consisted of two drills each, but that is not a reliable method of putting down an experiment of this kind. The manures were applied both with and without farmyard manure, and the results are given in Table I., p. 246.

There is very little difference in the amount of crop on the various plots, showing that the quantities of phosphate in 1, 2, and 3 were well chosen to put the plots on a par. Upon the whole the mixed phosphates are rather better than any individual one. As regards nitrogenous manure, $\frac{1}{2}$ cwt. nitrate of soda to 3 cwt. phosphate is found to be quite sufficient on undunged land, and anything more than that proportion does not pay. On the dunged land the application of more than $\frac{1}{2}$ cwt. nitrate of soda per acre is seen to be distinctly disadvantageous, and on this point all the experiments agree. The effect of increasing the nitrate was to cause the plants to come away more rapidly; but they suffered in vitality from their early start, and the slower-growing plots overtook them. The greater vigour of plot 2 shows that in that district some soluble phosphate in a turnip manure is advantageous.

Now as regards economy. These carefully conducted experiments show that the light manures have paid remarkably well. Where no farmyard manure was applied, but only the two fertilisers, the average crop was nearly 26 tons per acre, against $16\frac{1}{2}$ tons per acre on the unmanured land. There is

therefore a return of fully 9 tons of turnips for an expenditure of from 12s. to 20s. in manure; but plot 4, manured with 3 cwt mixed phosphates and $\frac{1}{2}$ cwt. of nitrate of soda at a cost of 15s. per acre, has produced almost the maximum crop. An increase of about 10 tons of turnips from the application of 15s. worth of manure must be regarded as very profitable manuring.

It has added much to the value of the Strathbogie experiments that the manures were applied also upon land that was dunged in the drills, as is the usual custom, so that we are able to compare the economy of light manures under the two conditions. The average produce of the plots that got nothing but farmyard manure was 22 tons 16 cwt., and the average of the plots which received phosphates and nitrate in addition was fully 29 tons. Plot 4 is again the maximum, and is nearly 7 tons better than plot 8 that got no artificials, and this increase was attained from the application of 15s. worth of manure.

So much for the artificials: they have yielded a very profitable return, both with and without dung, but especially without it. The quantity applied was small, and it is probable that with a more liberal application on the undunged land the produce would have been as heavy as on the land dunged in the drills, but how much more artificials would have been required to produce that result the experiment does not tell.

In the next place, we may inquire whether or not the application of farmyard manure has been profitable. The amount applied varied from 15 to 20 loads per acre. The average was 18 loads per acre, and it produced an average increase of nearly $6\frac{1}{2}$ tons per acre of turnips. If we value the dung at the moderate figure of 5s. per load, including the cost of haulage and spreading, we have an increase of $6\frac{1}{2}$ tons of turnips at a cost of £4, 10s., as against an increase of 10 tons by the use of 15s. worth of artificials. This may seem a very strong statement, but it may legitimately be stated even more strongly. If we compare the crop of plot 4 with and without farmyard manure, we find, with artificials alone, it produced 26 tons 4 cwt., while, with the addition of 18 loads farmyard manure, it averaged only 29 tons 13 cwt., so that 90s. worth of farmyard manure can only be credited with an increase of $3\frac{1}{2}$ tons of turnips. Such a mode of calculation is open to the immediate objection that turnip-growing is not the sole function of farmyard manure, which is applied only once, perhaps, in a rotation, and is intended to benefit the succeeding crops. That it does so is undoubted; and furthermore, it may be legitimately argued that dung has an important function to perform in maintaining the general condition of the land, which is not only a manure-holding medium, but also an arena in which living organisms play a very important part. All that may be

granted, but we must not take refuge in mere hazy speculation as regards the economical application of farmyard manure to the turnip crop in particular, which is the question immediately presented by the results of these experiments. A thoughtful farmer will ask himself seriously what is the crop of the rotation that farmyard manure is expected or intended chiefly to benefit, and however much he may hope for benefit to the white crops and grass of the rotation, he will confess that it is the root-crop that is expected to show the largest return from the application of that costly and precious manure.

The Strathbogie experiments show that in that district at least it is an expensive, and perhaps also an extravagant, practice. So far as the conservation of the manurial qualities of the dung is concerned, the fallow-break is the worst part of the farm on which it can be applied, for it is more liable to loss there than anywhere else. The crop that is capable of utilising most thoroughly the fertility contained in farmyard manure is grass, and in most districts it is second and third year's grass that is the most miserable thing on the farm. The application of some dung to the root-crop is on heavy land very desirable, and perhaps necessary for the sake of tilth; but even in such circumstances it is probable that great economy would be attained by putting only a half or a third of the dung upon the fallow-break, and distributing the rest over the rotation, and more especially on the second and third year's grass. This, however, is not the place to discuss this subject, nor have we here the data for doing so. It is a large and important question, and one which I hope will soon be taken up in a thoroughgoing manner by some local associations.

TURRIFF FARMERS' ASSOCIATION.

Experimenters.

Mr DAVID DAVIDSON, Cabra.
 Mr ADAM DAVIDSON, Boghead of Dunlugas.
 Mr WILLIAM STRACHAN, Upper Muirden.
 Mr ALEXANDER KEITH, Kinnermit.
 Mr ALEXANDER JACK, Backmill.
 Mr JOHN MILNE, Mains of Laithers.
 Mr ALEXANDER M. LEDINGHAM, Fintry (Slap).

Secretary.

Mr CRUICKSHANK, Claymires.

In the Turriff district, as in Strathbogie, the tests were applied both with and without farmyard manure, and careful notes were taken by those in charge of the work during the course of the season. They quite corroborate those made by the Strathbogie club. The weather was not so favourable for turnip-growing at Turriff, and the general crop was smaller.

(See Table II., p. 248, for the results obtained.) There are no great differences to record. The three kinds of phosphate, despite their difference in price, are all about the same in their efficacy. The slight advantage of the superphosphate over the others is hardly worth mentioning. Plots 4, 5, and 6 show that the nitrate of soda has been of some use, but the increase due to it is not worth the extra cost of the manure. The reason is obvious: the soils are light, sharp, and thin, and as a good deal of rain fell early in the season, much of the nitrate was probably washed away.

On the undunged land the application of 11s. worth of phosphate gave an increase of about 8 tons of turnips, just as it did in Strathbogie, and it would have been more profitable if no nitrate of soda had been used at all. Probably a less soluble nitrogenous manure would have been productive of greater benefit.

On the dunged land (plot 8) the crop was only about $8\frac{1}{2}$ tons per acre better than on that which got no manure of any kind; so that here again it is shown that 15s. worth of light manure makes as good a crop as 18 loads of dung, and the addition of that quantity of dung to the light manures produced an increase of only 3 tons of roots. No further comment is required upon these figures, but it is satisfactory to see that the results obtained in the two districts of Aberdeenshire, widely apart from each other, are quite concordant.

VALE OF ALFORD ASSOCIATION.

Experimenters.

Mr GEORGE WILKEN, Waterside of Forbes.
Mr J. W. BENTON, Cattie, Whitehouse.
Mr GEORGE F. BARRON, Meikle Endovie.
Mr ISAAC G. FRASER, Muirton of Corse.
Mr WILLIAM YULE, Glenloggie, Forbes.
Mr CHARLES FORBES, Upper Leochel.
Mr CHARLES M'COMBIE, Tillychetly.
Mr CHARLES M'INTOSH, Cairnballoch.
Mr JAMES CRAN, Knockandoch, Leochel.
Mr SAMUEL MATTHEWS, Bandeen, Craigievar.

Secretary.

Mr CHARLES M'CONNACH, Cairnballoch.

The experimenters in this district had only one experiment each—six without and four with farmyard manure. The plots were all visited during the month of August, and accurate notes taken of their progress by the Secretary, who took great interest in the experiments, and furnished many details; but owing to the generally favourable season, and the regularity and con-

cordance of the results, it is unnecessary to describe them. The figures given in Table III., p. 250, tell their story very plainly. Severe and long-continued frost diminished the bulk of the crop, but the bulbs were much healthier than in most parts of the country. Wet weather at the time of lifting interfered with the weighing of the tops. It is seen that the fully manured plots were all pretty even. The mixed phosphates were better than the simple ones, and no advantage accrued from increasing the quantity beyond $\frac{1}{2}$ cwt. of nitrate of soda per acre to 3 cwt. phosphates, and that quantity was sufficient to increase the crop by $2\frac{1}{2}$ tons per acre. It was noticed at Knockandoch and elsewhere, that where the proportion of $\frac{1}{2}$ cwt. of nitrate to 3 cwt. phosphates was exceeded, as on plots 5 and 6, there was an increase of tops, but the bulbs weighed less, and more of them were rotten. The tops were weighed in almost every instance, and in many instances the proportion of tops to bulbs afford very useful lessons, but the limits of this report prevent my entering upon that subject. It is a subject that will provide useful material for discussion and instruction in the various districts where the experiments were carried out.

Although the turnips, with and without farmyard manure, were grown on different farms, the general evenness of the results makes it not unfair to institute a comparison between them. The amount applied varied from 12 to 16 cubic yards per acre, and it is seen from a comparison of plots No. 8, that it produced an increase of only about 4 tons per acre. On the whole, the crops raised with 15s. worth of artificials are from $1\frac{1}{2}$ to 4 tons per acre better than those which got nothing but dung, and the combined dung and artificials did little better than the artificials alone. The results obtained on these farms corroborate very well those got in the Strathbogie and Turriff districts, and give a complete confirmation of the views expressed above—viz., that so far as the turnip crop is concerned, manuring with dung is an expensive practice, and that a mixture of the cheapest kind of phosphates, to the amount of 3 or 4 cwt. per acre, with $\frac{1}{2}$ cwt. of nitrate of soda, costing about 15s., gives a better crop at a fourth of the expense, and gives the strongest possible support to the view that some more advantageous method of utilising farmyard manure may be found than that of applying it chiefly to the turnip crop, as is the custom in most parts of the country.

We must not forget, however, that in drawing these inferences we are dealing here with the results of only one season, and that the conditions during 1880 may not have been so favourable as usual to the action of farmyard manure in producing a turnip crop. During very dry seasons the effect of light manures is scarcely seen upon the root-crop, while dung rarely if ever fails

to have a beneficial action. It would be an entire misinterpretation of these results to conclude that dung is an unsuitable manure for the root-crop, or that a small application of artificials at a cost of 15s. or so per acre would in all cases produce as good a crop of roots as 18 loads of dung. It would be a still greater mistake to infer from these experiments that dung is an expensive luxury which, were it possible, might be advantageously dispensed with as a fertiliser and as a means of maintaining the fertility of the soil. These experiments refer solely to the turnip crop, on the manuring of which far too much money has hitherto been lavished, to the detriment of other crops of the farm; and if, in addition to their chief object of discovering what is at once the cheapest and most efficient artificial manure for raising a crop of turnips, they have the effect of causing farmers to consider seriously how farmyard manure may be more economically employed than by applying it solely or chiefly to the fallow-break, their value will be thereby much enhanced. There is another error into which we must beware of falling in reading these experiments—viz., that the small dose of artificials employed in this instance is the maximum required for the turnip crop. It may be that double the quantity would be more advantageous. Doubtless that is so, as was found in some instances where the experimenters applied double the quantity specified in the schedule. Their experiments are not recorded, because the large quantity of manures applied swamped the distinctions between the plots which it was the object of the experiment to illustrate. The crops were large, but large crops were not wanted, and it is well that that fact should be borne in mind by many who may read this report, and who may be inclined to regard with contempt the smallness of the crop raised in some instances. They must be reminded that these crops were under-manured, and, moreover, that they were in many instances grown on the poorest land on the farm; but the information they have yielded is such as to enable the experimenters to grow the largest possible crop at the smallest possible cost.

There is another line of inquiry suggested by the experiments of those who applied the manures in double quantity, and that is the most economical way of distributing artificial manures over a rotation. Instead of applying 30s. worth of manure to the turnip, or even a larger quantity, as is quite customary in many places, it would doubtless be found more economical to apply one-third at least of that expenditure to other crops in the rotation. When farmers have gained some experience in the making of such experiments, there will be no difficulty in finding those in whose hands rotation experiments may be safely intrusted.

EXPERIMENT VIII. B.

A modification of the foregoing experiment was laid down upon a large number of farms in Kincardineshire and in Galloway. The phosphates were made to quantities of equal money value, and the small amount of nitrogenous matter of an insoluble kind contained in the steamed bone-flour, which was not taken account of in the other experiments, was regarded at its equivalent of nitrate of soda.

The quantities of manure and their cost per acre were as follows :—

Plot.	Quantities of Manure.	Per Acre. cwt.	Cost per Acre.			
			s.	d.	s.	d.
1. Steamed bone-flour		2	12	0	} = 14	6
Nitrate of soda		$\frac{1}{2}$	2	6		
2. Superphosphate		$3\frac{1}{2}$	10	0	} = 14	6
Nitrate of soda		$\frac{1}{2}$	4	6		
3. Thomas-slag		5	10	0	} = 14	6
Nitrate of soda		$\frac{1}{2}$	4	6		
4. Mixed phosphates ($2 + 3\frac{1}{2} + 5 \div 3$)		$3\frac{1}{2}$	10	0	} = 14	6
Nitrate of soda		$\frac{1}{2}$	4	6		
5. Mixed phosphates		$3\frac{1}{2}$	10	0	} = 16	9
Nitrate of soda		$\frac{1}{2}$	6	9		
6. Mixed phosphates		$3\frac{1}{2}$	10	0	} = 19	0
Nitrate of soda		1	9	0		
7. Mixed phosphates		$3\frac{1}{2}$	10	0	= 10 0	
8. Nothing		...	...	...		

A considerable number of those who put down the experiment with great care were not satisfied with the results, as they showed blanks and other irregularities that were due to causes independent of the manures. The following experimenters succeeded in obtaining results which were considered reliable :—

Major WM. DISNEY INNES of Cowie, Lumgair.
 Mr ALEXANDER FOTHERINGHAM, Whiteriggs, Fordoun.
 Mr JAMES CALDER, Midtown of Barras, Stonehaven.
 Mr JOHN RAE, Haddo.
 Mr JOHN YOUNG, South Rothnic, Stonehaven.
 Mr JOHN CAREY, Bridgeton Mains, St Cyrus.
 Mr WILLIAM DUNBAR, Newton, Raemoir, Banchory.
 Mr WILLIAM CLARK, Lochburn, Stonehaven.
 Mr J. SYMON, Gateside, Strachan, Banchory.
 Mr JOHN B. INNES, Elrich, Muchalls, Stonehaven.
 Mr JOHN PRATT, The Green, Raemoir.
 Mr CHARLES ROBERTSON, Hallhill, Kinneff, Berrie.
 Mr ADAM TAYLOR, Chapelton.
 Mr JOHN ABERNETHY, Criggie, St Cyrus.
 Mr ALEX. SILVER, Harvieston.
 Mr ROBERT MILNE, Upper Draighill.
 Mr JOHN TAYLOR, Uras, Stonehaven.

Mr ALEX. HUTTON, Wairds, Rickarton, Stonehaven.
Mr JAMES MILNE, Cairnhill, Muchalls, Stonehaven.
Mr ALEX. SPENCE, Crossgates, Dunnottar.
Mr JOHN SHEPHERD, East Kinmonth, Glenbervie.¹

Secretary.

Mr JOHN HART, Cowie, Stonehaven.

On the first six farms mentioned the experiment was tried both without dung and with it, and the results are shown on Table IV., p. 252.

These results confirm the main facts brought out by the Strathbogie and Turriff experiments, with this difference, that on some of the farms the effects both of light manures and of dung have been very little felt, and there has been no profit reaped, but only a loss sustained by manuring the turnip crop at all. This is not an uncommon experience when turnips are grown on land in good condition and during what are called good turnip years. Nevertheless what differences there are are quite in harmony with those obtained in Aberdeenshire; but there is this extra information, that when slag, superphosphate, and steamed bone-flour are applied in quantities of equal money value along with the same amount of nitrogenous manure, the slag is best, the superphosphate next, and the steamed bone-flour a little behind it; but although that is the general order, it is not invariable. The application of from 15 to 20 loads of dung has raised the average crop from about 15½ to about 18 tons, and the 14s. 6d. worth of light manure has done the same. Increasing the amount of nitrate from ½ cwt. to 1 cwt. has, as a rule, been of no benefit. The combined dung and artificials has produced only about 2 or 3 tons per acre more than either separately.

The majority of the Kincardineshire experimenters put down the experiment only along with dung.

The results are shown on Table V., p. 254, and for the sake of comparison they are divided into two sets, the lighter and the heavier soils.

These experiments corroborate all that has already been said above regarding the application of dung and manure, but in addition they show that artificials pay better on light soils than on heavy ones, and that a larger dose of nitrate pays better on heavy soils than on light ones.

GALLOWAY EXPERIMENTS.

The same experiment was tried by farmers in Kirkcudbrightshire and Wigtownshire, where a society for investigation has been organised.

The results of a few of these have been regarded as satisfactory—viz. :

Messrs R. & J. SHENNAN, Balig, Kirkcudbright.
Mr EDWARD GORDON, Keltonhill, Castle-Douglas.
Mr HUGH W. B. CRAWFORD, Auchencairn, Castle-Douglas.
Mr WILLIAM RUSSEL, Campdouglass, Castle-Douglas.

Secretary.

Mr ROBERT SPROAT, Lennox Plunton, Kirkcudbright.

The results are shown on Table VI., p. 256.

The average of these results quite corroborates those obtained elsewhere, and no special comment is called for. The experiments at Auchencairn and Keltonhill were damaged to some extent by disease and other causes, but the damage was general, and they convey like the others very useful lessons.

The general results of these experiments may be shortly summarised thus—

1. A mixture of slag and superphosphate with or without steamed bone-flour is a good, cheap, reliable kind of phosphate for application to the turnip-break.

2. The addition of some nitrogenous manure is usually necessary for obtaining a full crop, but the proportion need not be more than $\frac{1}{2}$ cwt. of nitrate of soda to 3 or even 4 cwt. phosphates; or speaking generally, the proportion of soluble nitrogenous manure should be such as would yield on analysis 1 part of ammonia to about 12 parts of phosphate of lime.

3. The application of dung at about 15 to 20 loads per acre has not increased the crop more than the application of 15s. worth of the above mixture.

4. The application of both dung and artificials has produced only about 3 tons more than either manure applied separately.

5. The application of nitrate of soda has been most profitable on the heavier class of soils.

6. On light soils dunged in the drills, phosphates may be applied with advantage, but nitrate of soda usually does not pay.

[TABLES.

TABLE I.—EXPERIMENT VIII. STRATHBOGIE FARMERS' CLUB.

Manures applied alone.

Plot	.	.	.	1	2	3	4	5	6	7	8
MANURES	.	.	.	Bone-flour	{ Super-phosphates }	Slag	Mixed	Mixed	Mixed	Mixed	None
PHOSPHATES, cwt. per acre	.	.	.	2	3	4	3	3	3	3	None
NITRATE	"	"	"	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	1	None	None
				tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.
Corsiestone	.	.	.	27 10	28 8	25 2	27 12	25 15	25 17	24 5	21 11
Downin.	.	.	.	26 16	28 10	27 0	28 6	27 1	28 19	27 14	16 3
Corse of Kinnoir	.	.	.	24 0	21 7	24 6	20 18	20 1	25 3	24 1	14 12
Arnhall.	.	.	.	26 17	26 4	26 2	27 16	28 16	28 17	25 6	19 11
Craigwillie	.	.	.	25 8	22 15	23 0	26 9	22 15	22 8	21 2	10 2
Average	.	.	.	26 2	25 8	25 2	26 4	24 18	26 5	24 10	16 8

Manures applied along with Farmyard Manure.

Corsiestone . . .	26	10	27	11	28	14	30	4	29	0	27	2	27	17	25	14
Downin . . .	33	10	34	4	34	3	34	0	34	0	33	11	34	13	21	17
Corse of Kinnoir . . .	28	10	28	7	28	8	26	18	28	2	26	7	25	13	21	3
Arnhall . . .	30	7	29	16	30	13	31	7	30	0	30	1	31	6	27	4
Craigwillie . . .	24	18	28	3	23	10	25	17	25	14	23	8	21	3	18	4
Average . . .	28	12	29	12	29	2	29	13	29	7	28	2	28	2	22	16
Coynachie . . .	19	9	19	13	18	19	21	1	21	1	21	4	20	11	17	17

Notes.—CORSIESTONE—Strong loam. Plot 6 started best, but soon stopped; 2 started well; 3 was greenest at the last, and seemed growing.

DOWMIN—Sandy loam. 2 came away best at first.

CORSE OF KINNOIR—Light loam. Turnips on dunged land were soonest ripe.

ARNHALL—Clay loam. 2 came away strongest.

CRAIGWILLIE—Brown loam on clay. 2 took the lead in both sets, but on undunged land it fell away.

COYNACHIE—Thin moor, 900 feet high. 6 came first. All pulled green. 1 and 2 had most rotten bulbs.

TABLE II.—EXPERIMENT VIII. TURRIFF FARMERS' ASSOCIATION.

Manures applied alone.

Plot	1	2	3	4	5	6	7	8
	Bone-flour	{ Super-phos- phates } 3	Slag	Mixed	Mixed	Mixed	Mixed	None
MANURES	2	1	4	3	3	3	3	None
PHOSPHATES, cwt. per acre	1	1	1	1	1	1	1	None
NITRATE	1	1	1	1	1	1	1	None
	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.
Cabra	24 9	24 3	24 9	25 2	25 14	26 7	25 7	12 19
Boghead of Dunlugas	15 3	15 9	13 1	12 6	14 16	16 7	16 13	3 9
Upper Muirden	15 8	14 6	13 11	14 18	15 6	15 9	13 9	11 6
Kinnernit	26 5	26 18	27 19	25 14	27 6	28 10	25 8	19 2
Backmill	16 3	18 2	22 0	15 0	19 15	19 5	18 15	10 10
Laithers	19 0	20 1	17 0	15 12	18 5	18 1	17 5	13 18
Average	19 8	19 17	19 13	18 2	20 6	20 13	19 9	11 17
Fintry (Slap)	20 3	20 15	22 12	20 10	19 13	21 0	18 11	18 15

Manures applied along with Farmyard Manure.

Cabra . . .	27 0	26 11	27 14	27 11	27 6	27 14	27 18	25 11
Boghead of Dunlugas . .	19 19	20 11	18 7	18 17	19 11	19 9	20 5	15 6
Upper Muirden . .	19 9	19 2	18 12	16 16	17 19	19 13	17 19	17 0
Kinnermit . .	26 9	25 14	26 3	27 16	26 17	24 12	26 0	21 0
Backmill . .	21 17	24 2	23 7	16 17	23 15	23 10	21 0	22 10
Laithers . .	22 9	22 12	23 6	21 0	20 11	21 19	19 17	19 6
Average . .	22 17	23 2	22 13	21 8	22 13	22 16	22 3	20 3

Notes.—CABRA.—Light stony land on hard stony clay, easily burned. Dung, 15 cubic yards.

BOGHEAD OF DUNLUGAS.—Soil friable, in poor condition; subsoil sandy clay. Dung, 12 cubic yards.

UPPER MUIRDEN.—Light sandy soil, hard subsoil, hungry land. Dung, 16 cubic yards.

KINNERMIT.—Loam. Dung, 18 tons.

BLACKMILL.—Stony clay. Dung, 12 cubic yards.

MAINS OF LAITHERS.—Thin sharp soil on clay-slate rock. Dung, 12 cubic yards.

FINTRY (SLAF).—Light loam on clay-slate subsoil.

TABLE III.—EXPERIMENT VIII. VALE OF ALFORD ASSOCIATION.

Manures applied alone.

Plot	.	.	.	1	2	3	4	5	6	7	8
MANURES	.	.	.	Bone-flour	{ Super-phos- phates 3 1 1	Slag	Mixed	Mixed	Mixed	Mixed	None
PHOSPHATES, cwt. per acre	.	.	.	2		4	3	3	3	3	None
NITRATE	"	"	"	1		1	1	1	1	None	None
				tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.
Waterside	.	.	.	19 9	17 6	17 4	20 3	19 17	20 16	14 13	15 17
Cattie	.	.	.	18 14	18 14	21 3	20 14	19 16	22 0	16 4	6 7
Muirton	.	.	.	17 5	19 17	21 2	23 4	21 1	21 2	19 14	16 0
Glenloggie	.	.	.	23 18	19 13	22 3	23 3	27 10	24 6	22 10	7 16
Upper Leochel	.	.	.	16 3	17 15	17 12	20 4	19 18	18 7	19 16	13 16
Average	.	.	.	19 2	18 13	19 17	21 9	21 12	21 6	18 11	12 0

Manures applied along with Farmyard Manure.

Meikle Endovie .	.	20	1	18	17	18	3	19	16	21	3	20	15	20	4	19	0
Tillychety .	.	19	0	20	11	20	14	18	17	19	11	20	0	20	6	16	0
Cairnballoch .	.	22	14	22	3	22	16	23	0	23	0	21	10	15	16	14	9
Knockandoch .	.	21	18	22	7	20	4	21	2	21	17	21	13	20	17	18	15
Bandeen .	.	19	1	20	17	19	11	20	9	20	16	21	7	20	18	20	0
Average .	.	20	11	21	0	20	6	20	13	21	5	21	1	19	12	17	13

Notes.—WATERSIDE—Soil light, subsoil granitic. After one-year-old lea. Number of turnips in Plot 6=91; in Plot 3=98, all sound.

CATTIE—Sandy loam.

MEIKLE ENDOVIE—Light loam. A few turnips rotten, especially in Plots 2 and 4. Scarcely any rotten in Plot 1.

MURTON OF CORSE—Light loam, with pan in subsoil.

GLENLOGGIE—Black loam, porous subsoil. 900 feet above sea-level. Plot 6 looked best for a few months, then gave way.

UPPER LEOCHEL—Poor clayey soil. Plots 1, 3, and 8 slow to start.

TILLYCHETY—Loamy. Crop very even throughout.

CAIRNBALLOCH—Loam, porous subsoil. Plot 3 backward at first.

KNOCKANDOCH—Heavy loam, clay subsoil, dampish. Plot 3 backward at first.

BANDEEN—Loam. The land was deeper in going from Plot 1 to 8.

TABLE IV.—EXPERIMENT VIII. B. KINCARDINESHIRE FARMERS' ASSOCIATION.

Manures applied without Dung.

Plot	1	2	3	4	5	6	7	8
MANURES	Steamed Bone-flour	Super-phosphates	Slag	Mixed	Mixed	Mixed	Mixed	None
PHOSPHATES, cwt. per acre	2	3½	5	3½	3½	3½	3½	0
NITRATE	1	½	½	½	¾	1	0	0
Per acre—	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.
Lumgair . . .	15 3	20 1	19 7	18 15	18 0	20 13	18 10	16 18
Whiteriggs, Fordoun . . .	17 8	17 3	22 0	17 15	18 7	18 7	17 0	14 14
Midtown of Barras . . .	20 16	20 10	20 13	16 0	17 0	19 14	19 11	19 10
Haddo . . .	18 10	17 5	16 10	16 0	20 0	20 0	16 10	10 10
South Rothnie . . .	20 3	17 5	19 3	20 3	17 14	18 11	17 5	16 6
Bridgeton Mains . . .	14 16	14 12	14 18	14 12	15 0	14 17	14 18	14 10
Average . . .	17 16	17 16	18 15	17 4	17 13	18 13	17 6	15 8

Manures applied along with Dung.

Lumgair . . .	19	12	23	2	25	8	22	9	23	5	23	3	22	1	19	18
Whiteriggs, Fordoun . .	13	8	16	8	18	14	17	1	14	17	15	10	14	13	13	7
Midtown of Barras . .	20	7	21	17	22	18	22	8	20	17	23	7	22	17	21	13
Haddo . . .	18	15	19	0	19	5	18	0	20	0	20	0	19	5	16	10
South Rothnic . .	24	5	24	13	26	19	25	16	26	16	23	18	23	4	21	18
Bridgeton Mains . .	13	18	14	4	15	3	15	10	15	15	16	4	17	2	14	2
Average . . .	18	8	19	17	21	8	20	4	20	5	20	7	19	17	17	18

Notes.—LUMGAIR—Light loam, with sandy subsoil. Dung, 22 yards per acre.

WHITERIGGS—Red loam, with sandy subsoil. Dung, 16 loads per acre.

HADDO—Red loam, with red till subsoil.

SOUTH ROTHNIC—Black loam, with a little clay on clay subsoil. Dung, 20 loads per acre.

BRIDGETON MAINS—Strong black loam, with clay subsoil. Dung, 17 loads per acre.

TABLE V.—EXPERIMENT VIII. B. KINCARDINESHIRE FARMERS' ASSOCIATION.

Manures applied along with Dung.

LIGHTER SOILS.

Plot	1	2	3	4	5	6	7	8
MANURES	Steamed Bone-flour	Super-phosphates	Slag	Mixed	Mixed	Mixed	Mixed	None
PHOSPHATES, cwt. per acre	2	3½	5	3½	3½	3½	3½	0
NITRATE " "	1	1	1	1	1	1	0	0
Per acre—	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.
Newton, Raemoir	21 16	22 6	21 4	21 7	22 2	23 0	21 0	17 11
Lochburn	14 19	16 8	15 13	18 19	18 19	16 11	15 18	14 0
Gateside, Strachan	17 16	21 8	14 18	18 1	19 8	17 16	18 11	12 11
Elrich, Muchalls	19 0	18 5	20 6	18 5	20 17	21 9	21 19	15 9
The Green, Raemoir	21 3	21 7	22 8	22 6	24 7	22 9	20 8	19 7
Hallhill, Kinneff	18 17	19 2	18 4	22 2	16 14	18 14	18 0	...
Chapelton	15 8	15 11	13 3	11 2	16 0	13 0	12 14	10 17
Average	18 9	19 5	18 0	19 0	19 15	19 0	18 7	15 0

HEAVIER SOILS.

Criggie, St Cyrus	.	18	11	20	0	23	7	20	1	21	15	19	8	20	1	18	15
Harvieston	.	26	15	27	4	27	13	28	5	29	8	28	8	27	1	26	18
Uras	.	18	6	18	2	18	10	20	13	20	6	19	9	18	10	18	0
Wairds, Rickarton	.	17	5	16	8	14	3	13	8	15	3	15	5	15	8	12	0
Cairnhill, Muchalls	.	19	14	21	5	19	3	18	17	21	5	26	11	22	11	18	17
Crossgates, Dunnottar	.	24	12	24	15	24	0	24	7	25	2	25	3	23	4	21	0
Average	.	20	17	21	6	20	9	20	17	22	3	22	7	21	3	19	5

Notes.—NEWTON—Light loam, on sandy subsoil. Dung, 15 yards.

LOCHBURN—Soil, light sandy loam. Dung, 24 yards.

GATESIDE—Light sandy haugh-land.

ELRICH—Soil, black moss. Dung, 15 loads.

THE GREEN—Soil, light, black, on pan subsoil. Dung, 18 loads.

HALLHILL—Soil, black loam, on hard gravel. Dung, 15 loads.

CHAPELTON—Soil, free brown, on red pan. Dung, 15 loads.

CRIGGIE—Deep black loam, on sandy subsoil. Dung, 24 yards.

HARVESTON—Deep loam, on sandy subsoil. Dung, 15 loads.

URAS—Black friable loam. Dung, 11 yards.

WAIRDS—Light loam, on clay.

CAIRNHILL—Free black soil, clay subsoil. Dung, 20 loads.

CROSSGATES—Black loam, clayey subsoil. Dung, 15 loads.

TABLE VI.—EXPERIMENT VIII. B. VARIOUS DISTRICTS.

Manures applied alone.

PLOT	1	2	3	4	5	6	7	8
	Bone-flour	$\left\{ \begin{array}{l} \text{Super-} \\ \text{phos-} \\ \text{phates} \end{array} \right\}$	Slag	Mixed	Mixed	Mixed	Mixed	None
MANURES	2	$3\frac{1}{2}$	5	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	0
PHOSPHATES, cwt. per acre	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	1	0	0
NITRATE								
	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.
Per acre—	17 1	22 5	15 13	19 6	21 12	20 6	20 10	14 12
Lennox Plunton	23 13	25 5	24 16	25 8	23 18	25 2	24 16	18 0
Balig	13 5	15 0	17 3	16 10	16 0	15 15	17 10	6 4
Auchencairn	9 7	9 11	11 8	11 8	12 6	12 2	9 7	7 14
Keltonhill	15 13	16 1	16 0	16 4	16 5	17 0	16 16	15 12
East Kinmonth								
Average	15 16	17 12	17 0	17 16	18 0	18 0	17 16	12 4

	<i>Manures applied with Dung.</i>															
	8	18	12	13	10	16	12	11	12	4	13	6	11	2	8	2
Keltonhill (double manured)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Campdouglass	.	18	6	17	19	17	13	17	0	16	0	15	17	15	1	8
																4

Notes.—LENNOX PLUNTON—Soil, friable loam.

BALIG—Soil, stiff, subsoil tilly.

AUCHENCATRAN—Soil sharp, dry; subsoil granite. Finger-and-toe general over the plots and all the field; plot 8 suffered most.

KELTOSHILL—Soil light, dry, thin, poor, and stony.

CAMPDOUGGLAS—Soil light, loam of good quality.

EXPERIMENT VI.

This experiment has a similar object to that of the foregoing Experiment VIII. It is a comparison between superphosphate and slag as an economical turnip manure, but it has the further object of determining whether these phosphates may be applied during winter as usefully as at the time of sowing. A soluble nitrogenous manure was sown along with them—viz., either sulphate of ammonia or nitrate of soda. The former does not do to mix with slag, and the latter does not do to mix with superphosphate, on account of the loss of nitrogen which occurs in both cases. Accordingly it was arranged that the superphosphate should be mixed with sulphate of ammonia, and the slag with nitrate of soda. Moreover, it was determined to try the effect of various quantities of the nitrogenous manure, to find out whether the larger or the smaller proportion was most economical.

The following were the quantities of manure applied and the cost per acre:—

Quantities of Manure for Plot of $\frac{1}{10}$ Acre.				Cost per Acre.	
Plots.			lb.		s.
1 and 7.	Superphosphate	.	15	}	18
	Sulphate of ammonia	.	1		
2 and 8.	Superphosphate	.	15	}	22
	Sulphate of ammonia	.	2		
3 and 9.	Superphosphate	.	15	}	26
	Sulphate of ammonia	.	3		
4 and 10.	Thomas-slag	.	20	}	15
	Nitrate of soda	.	$1\frac{1}{4}$		
5 and 11.	Thomas-slag	.	20	}	19
	Nitrate of soda	.	$2\frac{1}{2}$		
6 and 12.	Thomas-slag	.	20	}	23
	Nitrate of soda	.	4		

On plots 1 to 6 the manures were applied in winter, and on plots 7 to 12 at the time of sowing. The winter-applied manures were not covered in, but simply spread on the ploughed land and left there. The application of nitrate of soda to fallow land months before the crop is sown is a practice which all knowledge and experience have shown to be wasteful; nevertheless it was thought useful to give a practical exhibition of the wastefulness of the practice, especially as it was the opinion of some of the experimenters that the loss of nitrates during the winter was not so great as had been frequently represented. Necessarily the loss of nitrates is greatest during wet seasons; but as the spring of 1890 was an unusually dry one in the Kelso and Lauder districts, the loss was at a minimum, and the effects of the early application of nitrates are quite distinct.

This experiment was taken up by the Border Farmers, and also by the Bothwell Association, and others; but although many tried it, only a few have reported their experiments as completely successful. Failure occurred from a good many causes, most of which were beyond control.

Experimenters.

Mr R. SHIRRA GIBB, Boon, Lauder.
 Mr JAMES R. C. SMITH, Mowhaugh, Kelso.
 Mr JOHN FULTON, Hatchednize, Coldstream.
 Mr ROBERT DICKINSON, Newbigging, Lauder.
 Mr JOHN MACKAY, Lauderdale Estates.
 Mr GEORGE HENDERSON, Shidlaw.
 Mr WILLIAM MARSHALL, Knowehead, Carluke.
 Capt. A. B. PURVIS, R.A., Kinaldy, St Andrews.

Table I., p. 260, gives the results obtained, first with the superphosphate and sulphate of ammonia, and second, with the slag and nitrate, according as they were applied early and late, and with one, two, or three doses of nitrogenous manure. The figures are not many, and each experiment may be profitably read and considered by itself. The seven complete reports from the Borders are grouped together, and their averages struck. These averages inform us—

1. As regards superphosphate and sulphate of ammonia, the early application may be as good as the later one.

2. As regards the quantity of sulphate of ammonia, 40 lb. of it per acre is just as good as three times that quantity.

3. As regards slag and nitrate of soda, there is a loss of nitrate when applied early, but the loss is not so very marked.

4. As regards quantity of nitrate of soda, 50 lb. of it per acre is just as good as three times that quantity.

5. As between superphosphate and sulphate of ammonia on the one hand, and slag and nitrate of soda on the other, the advantage lies with the latter. It is cheaper, and also more productive.

The other three experiments, in widely different districts, must be considered separately. At Shidlaw the very early applied manures were distinctly inferior; and at Kinaldy, on thin moory land, the loss of nitrogen was still more marked; but these are extreme cases, where the soluble nitrogenous manures were applied in January and February. In practice it will seldom occur that such very early application of light manures would be desirable. Their application one or two months before sowing the seed would be as early as would be found necessary to relieve the pressure of labour at the turnip-sowing season, and several of the experiments show that the practice may be adopted quite safely.

TABLE I.—EXPERIMENT VI. BORDER FARMERS' CLUB.
Superphosphate and Sulphate of Ammonia.

No. of Plot		Manures applied early.				Manures applied in Drills.			
		1	2	3	7	8	9		
	Per acre—	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	tons cwt.	
Boon	.	20 3	18 19	17 9	18 15	18 11	20 1		
Mowhaugh	.	12 2	12 5	18 10	14 3	14 4	16 3		
Hatchednize.	.	15 12	13 13	14 5	17 10	16 8	16 19		
Newbigging (a)	.	16 7	18 10	17 0	17 19	17 18	16 10		
Do. (b)	.	20 0	19 11	23 4	19 6	19 0	23 0		
Newmills	.	8 7	8 10	9 2	8 3	8 2	9 4		
West Mains.	.	7 0	7 15	8 15	6 2	8 7	10 5		
Average	.	14 4	14 3	15 9	14 11	14 13	14 12		
Shidlaw	.	26 11	23 12	25 14	28 3	25 6	30 3		
Kinaldy	.	12 0	11 14	12 0	17 7	19 11	20 4		
Knowhead	.	...	...	...	19 13	18 14	19 14		

Thomas-slag and Nitrate of Soda.

No. of Plot	4	5	6	10	11	12
Boon	14 3	13 16	13 10	18 6	16 8	18 4
Mowhaugh	21 4	20 8	20 7	18 13	19 14	20 7
Hatchednize.	15 17	16 12	15 12	15 19	15 17	16 13
Newbigging (a)	16 10	18 0	19 0	18 1	19 6	17 2
Do. (b)	18 8	19 13	21 0	20 10	21 12	23 0
Newmills	11 19	12 19	14 8	14 2	14 14	15 10
West Mains.	8 7	6 18	7 6	10 10	10 0	7 15
Average	15 4	15 9	15 18	16 11	16 16	16 19
Kinaldy	14 17	15 7	19 10	17 6	19 14	18 17
Knowehead	...	...	...	17 14	17 2	17 17

Notes.—BOON—Gravelly loam, shallow, on boulder-clay. Early manuring, January.
 MOWHAUGH—Medium loam, boulder-clay on trap. 9 yards poor dung in addition. Early manuring, January.
 HATCHEDNIZE—Light loam.
 NEWBIGGING—Early manuring, April 12; late manuring, May 10. (a) Yellows; (b) Swedes.
 NEWMILLS—Very poor land. Early manuring, April 9; late manuring, June 7.
 WEST MAINS—Very poor land. Early manuring, April 11; late manuring, June 25.
 SHIDLAW—Heavy loam. Early manuring, February 25; late manuring, June 6.
 KINALDY—Poor, thin, moorish soil. No dung applied. Early manuring, January 6.
 KNOWEHEAD—Black loam. Dunged in drills. Late manuring, June 5.

ANALYTICAL ASSOCIATIONS.

During the year 1890, twenty associations made returns to the Society of the analyses of manures and feeding-stuffs done by their chemists for their members. The number and kind of analyses are given in the subjoined table (p. 265). As usual, the bone-meal samples are most numerous, but the proportion is not so great as in former years. The samples of superphosphates are on the increase, and so are the samples of dissolved bones.

Under the name "Dissolved bones" it has been for many years the practice to include a great many dissolved manures that have no pretension to the name. They were simply compounds of manurial substances, many of them excellent manures, but not necessarily containing any vestige of bone. Since the passing of the Merchandise Marks Act it has become illegal to sell under the name of "Dissolved bones" anything but the genuine article, and most of the samples analysed for the associations were probably of that description. Nevertheless it is evident from mere inspection of the analyses that fully one-fourth of the dissolved bone samples were not genuine, and the probability is that others belonged to the same category, although their analyses resembled that of genuine dissolved bones perfectly. It is often extremely difficult to determine by ordinary observation and analysis whether a sample is genuine or not, and it is possible that samples much adulterated may be passed by experts as genuine. The ordinary analytical tests employed are not sufficient to detect some skilfully made imitations where the greater part of the manure does actually consist of dissolved bone. Nevertheless it is possible to detect the adulteration by means of special analysis and investigation, so that no one vending such a manure need hope to escape detection if the buyer is prepared to have a special analysis made with the view of detecting the adulteration.

The Chemical Committee has for many years advocated the adoption of some other name than dissolved bones to describe that large and useful class of dissolved manures that has hitherto been improperly sold under the name, and they sympathise with those in the manure trade who are loyal to the terms of the Act, and who find it difficult to compete with others who still persist in the sale of the sophisticated article. Accordingly it has been resolved that in future, when any cases come under the notice of the Chemical Committee in which spurious manures are sold under the name of dissolved bones, the names of the sellers will be published in the 'Transactions,' along with

those found selling manures and feeding-stuffs notably deficient from their guarantees.

During 1890 the number of deficient manures reported by the associations was somewhat in excess of that for the few years previous. A careful examination into the circumstances of each case showed that in all but four cases the deficiencies admitted of satisfactory explanation.

The four cases in question were—

1. (*Sample No. 21*) "Dissolved bones" sold to a member of the Arbroath Analytical Association by Messrs Dodds & Bathie, auctioneers, Arbroath. It was sold by them through an agent as genuine dissolved bones, and guaranteed to contain—

	Per cent.
Soluble phosphate	20
Insoluble phosphate	12
Nitrogen = ammonia	2½

On analysis by the chemist of the Association it was found to contain—

	Per cent.
Soluble phosphate	22.12
Insoluble phosphate	8.44
Nitrogen = ammonia	1.82

It is needless to say that this is not the analysis of a sample of genuine dissolved bones, and the deficiency is fully one-fifth of the ammonia guaranteed. The sellers disclaimed responsibility owing to an alleged neglect of care at the sampling; but when notice was given to the sellers that another sample would be drawn on a certain date, they sent no one to see it done, and stated as their reason that the manure had been for some weeks in the buyer's possession.

The remaining three deficient manures were sold to members of the Lanarkshire Analytical Association—viz.:

2. (*Sample No. 14*) Turnip manure sold by Mr S. M. Thomson, Lanark, and guaranteed to contain—

	Per cent.
Soluble phosphate	12
Insoluble phosphate	15
Nitrogen = ammonia	5

The analysis of the Association's chemist showed it to have the following composition:—

	Per cent.
Soluble phosphate	13.88
Insoluble phosphate	10.58
Nitrogen = ammonia	3.58

The deficiency is nearly 1½ per cent ammonia. The seller

cannot account for the deficiency, and is inclined to think it must be due to an error in the analysis; but an analysis of the duplicate sample in the hands of the Chemical Committee confirms the deficiency found by the chemist. The Committee is therefore of opinion that the deficiency is due to an error in the manufacture.

3. (*Sample No. 19*) Pure dissolved bones, also sold by Mr S. M. Thomson, was found deficient both in soluble phosphate and ammonia. The seller explains that owing to the temporary illness of his foreman, the manure intended for the Association was sent elsewhere, and a different stuff was supplied to them.

The Secretary of the Association informs the Committee that a suitable abatement of price was made by the seller in both these cases.

4. (*Sample No. 15*) sold under the name of "Extra dissolved bones" by Messrs Alexander Cross & Sons, Glasgow, and guaranteed to contain—

	Per cent.
Soluble phosphate	20
Insoluble phosphate	6
Nitrogen = ammonia	2½

was found by the analyst to contain—

	Per cent.
Soluble phosphate	21.12
Insoluble phosphate	7.76
Nitrogen = ammonia	1.65

The sellers are at a loss to understand the discrepancy, and think it must be due to an error of sampling; but as the sampling of manure by the Association is conducted in accordance with the Society's regulations, and as the sellers had an opportunity given them of witnessing the operation, the Committee cannot accept the seller's explanation. They desire also to point out that the name under which it was sold is a very misleading one. The name "Extra dissolved bones" would lead a buyer to expect that he was getting dissolved bones of extra good quality, but the sellers explain that the manure delivered was not genuine dissolved bones, but one of their dissolved bone compounds, and that when the deficiency was discovered they made a reasonable reduction in the price to the buyer.

MANURES AND FEEDING-STUFFS FOR WHICH GRANTS WERE GIVEN, 1890.

	Bone-meal.	Steamed bone- hour.	Dissolved bones.	Superphos- phate.	Phosphate (sing).	Fish-manure	Compound manure.	Nitrate of soda.	Sulphate of ammonia.	Potash- manure.	Linseed- cakes.	Other cakes.	Other feed- ing-stuffs.	Complete analyses.	Partial analyses.	Total.
1. Alford . . .	7	...	1	4	1	...	1	...	...	...	4	...	...	13	5	18
2. Annandale . . .	1	...	2	...	...	...	1	...	...	...	...	...	...	4	0	4
3. Arbroath . . .	3	2	4	5	...	...	3	1	...	...	11	...	1	25	6	31
4. Avondale . . .	1	...	...	1	...	...	...	1	1	...	...	...	...	1	3	4
5. Buchan . . .	8	...	...	2	1	...	...	...	...	...	...	...	...	7	4	11
6. Carse of Gowrie . . .	2	1	1	1	...	...	...	...	...	...	4	1	1	10	1	11
7. Galston . . .	1	...	2	...	...	...	...	...	...	...	...	...	...	3	...	3
8. Grougar . . .	1	...	1	...	...	...	...	1	1	...	...	...	...	2	2	4
9. Kelso . . .	1	...	1	2	...	...	1	1	...	...	...	...	...	3	2	5
10. Kintyre . . .	...	...	4	2	1	...	...	1	1	...	...	...	...	4	3	9
11. Kirkcudbright . . .	7	...	2	3	...	...	5	...	...	...	...	...	...	14	3	17
12. Kirriemuir . . .	1	1	...	2	...	...	...	...	1	...	...	...	...	2	2	4
13. Lanark . . .	1	1	1	5	...	...	3	4	1	1	1	...	1	8	11	19
14. Morey . . .	2	...	...	3	...	3	1	...	...	...	...	...	...	6	3	9
15. Nairn . . .	2	1	3	2	1	1	1	...	...	...	...	...	...	8	3	11
16. Easter Ross . . .	...	...	...	1	...	1	...	...	...	...	1	3	...	5	1	6
17. Wester Ross . . .	6	...	...	6	...	...	...	...	1	1	...	...	...	6	8	14
18. Stoneykirk . . .	5	...	...	1	1	1	2	...	...	...	...	...	...	8	2	10
19. Strathearn . . .	...	...	...	...	...	...	2	...	...	...	...	...	...	2	...	2
20. Turriff . . .	4	1	...	2	3	1	5	...	...	...	...	...	...	11	5	16
Total . . .	53	7	22	42	8	7	26	8	5	2	21	4	3	142	66	208

AGRICULTURAL COSTS IN SCOTLAND.

By GEORGE BROWN, Watten Mains, Caithness.

"A PAPER on agricultural costs, giving full details of the costs of all farm operations in different parts of Scotland—as, for instance, the cost per acre of ploughing, grubbing, harrowing, harvesting, &c., stating rate of wages and all data of calculations," appears to me to be somewhat of a "large order," when we consider the different methods of farm practice in the various districts throughout Scotland, the character of the soils, the vicissitudes of climate, the brains of the farmer, the activity of the labourer, and the general fitness of the horses.

The cost of tillage operations has, however, a very important bearing on the future of British agriculture. There can be no doubt that cost of production is now the chief factor in regulating the changes of procedure in farming which are being adopted by the great bulk of farmers in this country. In former times, when the produce of our cultivated crops left a fair margin for profit over the cost of production, farmers took little note of the actual expenses incurred in raising the various crops. Nowadays all this has undergone a complete change, and every source of information is being brought to bear upon the subject, so as to enable the distressed agriculturist to hold his own. It is the cost of production which in the future must determine whether the arable lands of Britain are to be converted into immense grazing grounds, or continue, as they have ever been, an example from which every nation on earth has derived lessons in all that relates to scientific and practical agriculture.

From an agricultural point of view the cost of tillages deserves the serious consideration of every landlord, farmer, and labourer throughout the kingdom, as economical tillage is the very key-stone of all successful farm practice. It means a fair rent to the landlord, better prospects to the farmer, and a margin to allow of increased payments to the labourer. Not only this, but it affects the entire community in a very direct manner. As a decreased production from the soil diminishes the capital of the country, lessens available food commodities, which eventually must tend to higher prices, the capitalist must suffer from a smaller return from investments, and the British workman will have to face competition from the rural labourer in the markets of the country, which will result in lower wages and dearer food. The cost of tillages meets the farmer at every turn,—at his entry to a farm, during his occupancy, and at the termination of his tenancy. Some kind of data seem therefore a necessity, not only that valuations of tillages

be carried out in a business-like manner, but in order to assist in determining which crop will leave a return for the labour, and which system of cropping or rotation will best suit the altered circumstances which affect agriculture in the present day.

Keeping in view these circumstances, the writing of this paper has been undertaken with extreme diffidence, as anything set forth in the following must of necessity be of the character of an approximate estimate of the various costs, as no hard and fast line can be laid down for any county or crop.

With these remarks, we shall now proceed to examine in detail the data upon which an estimate of the value of tillages may be obtained. This naturally divides itself into the following:—

1st, The actual cost of horse labour.

2d, The wages and perquisites of the labourer.

3d, The extras in connection with men, horses, and implements.

4th, The number of days a horse is at work during the year.

5th, The amount of work performed during a day of ten hours.

We have first to consider the cost of maintenance of a work-horse during the year, the extras which result from the employment of horses in agricultural operations, and the number of days the horse is at work during the year.

We shall now submit to our readers, in the first place, the following replies received from practical farmers in nearly every county in Scotland to the undernoted queries. What will the keep of a horse cost per week or year?—

1. Winter, spring, and autumn keep from 1st October to 20th June, say $37\frac{1}{2}$ weeks.

2. Summer, from 20th June to 30th September, say $14\frac{1}{2}$ weeks.

3. Extras, tradesmen, depreciation and risk, interest, stable requisites.

When the replies were received and compared, it was found necessary to divide the country into districts, as rate of wages, cost of produce, character of soil, and system of feeding vary to a considerable extent. We regret being unable to give the authority in each case, as many of the schedules are given as an average of two or more which were issued to many districts, and a few have requested to allow their names to remain unpublished.

When difference of feeding has occurred in separate schedules from the same district, these are given in detail. In many of the schedules the replies are not clearly set forth, notably in the kind of stones, whether 14 lb., 22 lb., or 28 lb. is meant. The rate per week has, however, been given, and in most instances the quantity of hay, straw, &c., has been converted into the imperial stone. In summer keep the money value has been given, as the time has been divided into periods when corn, soiling, and grazing have been respectively given.

General average for district during year, £29, 18s. 9d.

SOUTH-WESTERN DISTRICT.

Winter Keep, say 17½ Weeks.

	Hay.	Straw.	Turnip.	Oats.	Beans.	Price.	Cost per week.	Cost during period.
	St.	St.	s. d.	Bush.	s.	s. d.	s. d.	£ s. d.
Dumfries .	340	120	15 0	100	...	{ Hay 0 4½ Straw 0 3 Oats 2 3 }	10 10	20 6 6
Kirkcudbright	262	262	37 0	114	...	...	12 1	22 17 3
Wigtown .	496	...	18 6	87	...	{ Hay 0 4 Oats 2 3 }	9 10	18 9 7
Lanark .	196	200	37 0	114	...	{ Hay 0 4½ Straw 0 3 Oats 2 3 }	11 1	20 17 0
Dumbarton .	375	150	12 6	75	19	{ Hay 0 4 Straw 0 3 }	11 5	21 9 3

Summer Keep, say 14½ Weeks.

	Hay.	Soiling.	Grazing.	Oats.	Cost per week.	Cost during period.
	s.	s. d.	s. d.	s. d.	s. d.	£ s. d.
Dumfries .	...	...	87 0	37 4	8 7	6 4 4
Kirkcudbright .	...	14 6	58 0	51 4	8 6	6 3 10
Wigtown .	...	...	72 6	40 6	7 10	5 13 0
Lanark .	...	...	87 0	65 3	10 6	7 12 3
Dumbarton .	29	...	72 6	32 8	9 3	6 14 2

General average for district during year, £26, 18s. 10d.

CENTRAL DISTRICT.

Winter Keep, say 37½ Weeks.

	Hay.	Straw.	Turnip.	Oats.	Beans.	Price.	Cost per week.	Cost during period.
	St.	St.	s.	Bush.	s. d.	s. d.	s. d.	£ s. d.
Stirling .	96	280	25	75	14½	{ Hay 0 4½ Straw 0 3 Oats 2 3 }	9 9	18 5 5
Perth .	450	...	18	130	...	{ Hay 0 4 Oats 2 3 }	12 0	22 10 6
Fife .	388	...	18	76	...	{ Hay 0 4½ Oats 2 3 }	8 5	15 13 6
Kincardine .	206	412	18	76	...	{ Hay 0 4½ Oats 2 3 }	9 9	18 7 0
Forfar .	370	...	10	114	...	{ Hay 0 6 Oats 2 3 }	12 0	22 11 6

CENTRAL DISTRICT—*continued.*

<i>Summer Keep, say 14½ Weeks.</i>									
			Hay.	Soiling.	Grazing.	Oats.	Cost per week.	Cost during period.	
			s.	s. d.	s. d.	s. d.	s. d.	£ s. d.	
Stirling	...	...	...	...	65 3	45 6	7 7	5 10 9	
Perth	...	...	...	...	72 6	32 8	7 3	5 5 2	
Fife	...	...	...	50 9	50 9	32 8	9 3	6 14 2	
Kincardine	...	...	...	...	58 0	27 0	6 0	4 5 0	
Forfar	...	...	18	...	72 6	20 3	7 7	5 10 9	

General average for district during year, £26, 2s. 6d.

NORTH-EASTERN DISTRICT.

<i>Winter Keep, say 37½ Weeks.</i>									
	Hay.	Straw.	Turnip	Oats.	Beans.	Price.	Cost per week.	Cost during period.	
	St.	St.	s. d.	Bush	s. d.	s. d.	s. d.	£ s. d.	
Aberdeen	370	...	18 0	94	...	{ Hay 0 4 Oats 2 3	{ 9 3	17 12 0	
Aberdeen	225	225	18 0	94	...	{ Hay 0 4½ Oats 2 3	{ 9 10	18 10 1	
Banff	370	120	12 0	76	Bran. 43/9	{ Hay 0 4½ Straw 0 3 Oats 2 3	{ 10 5	19 12 10	
Elgin	3/9	pr. wk.	37 0	7s.	pr. wk.	...	11 9	22 0 7	
Nairn	262	181	...	76	...	{ Hay 0 6 Straw 0 3 Oats 2 3	{ 10 8	20 1 0	
Ross	412	...	76 0	76	...	{ Hay 0 5 Oats 2 3	{ 11 1	20 16 5	
Caithness	144	364	10 0	96	...	{ Hay 0 4½ Straw 0 3 Oats 2 3	{ 10 2	19 1 0	
Orkney	206	206	31 3	94	...	{ Hay 0 6 Straw 0 3 Oats 2 3	{ 10 7	19 17 3	

NORTH-EASTERN DISTRICT—*continued.*

<i>Summer Keep, say 14½ Weeks.</i>								
	Hay.	Grazing.	Soiling.	Oats.	Cost per week.	Cost during period.		
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>	£	<i>s. d.</i>	
Aberdeen . . .	...	72 6	...	32 8	7 3	5	5	2
Aberdeen . . .	...	40 0	21 8	39 4	7 0	5	1	0
Banff . . .	21 3	24 0	17 0	21 3	5 9	4	3	6
Elgin . . .	...	72 6	...	...	5 0	3	12	6
Nairn . . .	...	72 6	29 0	...	7 0	5	1	6
Ross . . .	...	58 0	...	...	4 0	2	18	0
Caithness . . .	18 0	47 6	...	17 0	5 9	4	2	6
Orkney . . .	...	72 6	...	...	5 0	3	12	6

General average for district during year, £23, 18s. 5d.

For the sake of comparison, I here append the general averages as given in the preceding table, along with Mr Morton's estimate, Professor Wrightson's, and two estimates taken from the 'Transactions' of your Society:—

South-eastern . . .	£29 18 9	Mr Morton . . .	£22 7 0
South-western . . .	26 18 10	Professor Wrightson . . .	18 17 0
Central . . .	24 2 10	Mr Gibson, Woolmet . . .	24 0 11
North-eastern . . .	23 18 5	Mr Binnie, Seton Mains . . .	28 10 0

In the cases of Messrs Gibson and Binnie, we find oats charged at the rate of 17s. per quarter of 40 lb. per bushel, straw at 4d. per stone, so that prices are much similar to those at the present time. Mr Morton's estimate is arrived at by averaging 35 selected cases, and Professor Wrightson's has been evolved from his own inner consciousness.

Having arrived at the actual cost for the food of a horse during the year, we shall now proceed to the extras.

Tradesmen—Blacksmith and Saddler.—In many parts of the country blacksmith work is done by contract for the shoeing of each pair of horses, and the repair of ploughs, harrows, &c. This may be taken as £3 yearly per pair. On examining the fifty schedules which have been returned, the average for blacksmith and saddler is exactly £2, 18s. This sum is a fair estimate, and we take it as the basis, it being understood that implements, which follow the horse as well as the harness, are entirely kept up by this sum.

Depreciation and Risk.—Many of the schedules estimate this at 10 per cent on value; but there are two exceptions which are well worth quoting. Mr Blaikie, Holydean, says: "The value of a horse at five years old, £50; at fifteen years, worth

£10,—depreciation and risk of blemish, £5; cost of insurance against death, say on £30 at middle age, £1, 12s. 6d. This works out a total of £6, 12s. 6d." Mr Gordon, Elgin, puts it somewhat differently: "The depreciation on a horse averages £3 per annum—that is, a horse worth £50 when five years old, will not be worth more than £20 at fifteen; but this loss should be avoided or made up by every intelligent farmer." These views are, in our opinion, somewhat extreme. A horse, if fairly treated, ought to be worth more than £10. We have a saying in the North that a fifteen-year-old horse is worth £1 for every year he has seen. Let us take it that such a horse is £15: this leaves £35 to be spread over ten years, which comes to £3, 10s. per annum. Mr Gordon overlooks risk, and puts too high a price on his old horse. As to the avoidance of this loss, some man must lose it; and although horses change hands, farmers bear the loss either collectively or individually. Ten shillings per annum cannot be said to be an overcharge to cover risk of death or blemish. On averaging the schedules, we find £4, 3s. as the sum against these items. We may, therefore, state it as amounting to the sum of £4 per annum.

Interest on Value.—The usual 5 per cent rate may be the rule here.

Stable Requisites.—These are represented by repairs to fittings, combs, and other necessities—say, repairs 10s., combs, &c., 7s. 6d. Rent cannot be charged, as it will be included in the gross rent of the farm, and fall to be charged to the various crops in the rate per acre for rent.

Number of Working Days.—The number of working days seems to be the point on which the greatest diversity of opinion exists amongst the farming community. We shall in consequence go a little into detail on this subject. In some districts we find the returns pretty much alike: for instance, the north-eastern, with one exception, puts the number of days a horse is at work as between 220 and 240, varying according to proximity to sea-coast and character of soil; while in the south-eastern the returns show a very marked difference, the figures ranging between 230 and 300 days. When we consider the area covered by these returns, and the marked difference in climate, soil, and farming, there are sufficient reasons for the conflicting nature of the schedules. Still we cannot help thinking 300 days is an over-estimate, even when large quantities of hay have to be secured, or where the carting of grain and manures is left over until the summer months.

We consider in ordinary seasons there are really fewer days on which horses are idle than is generally supposed. We have first 52 Sundays, 4 holidays and fast days, 32 wet and frosty days

during winter and spring. Now on a 500-acre farm there will be a turnip break of from 90 to 100 acres, the first singling of which will occupy 15 hands from 18 to 20 days. During this time all the horses are idle on most farms, except say 3 working the scufflers. This would lead us to estimate, say, 14 days. Then we have 120 days during winter on which, on an average, the horses only work 8 hours, which would result in another 24 days of idle time. We shall allow the extra hours during harvest, and the one half of the horses working during cutting time, to balance the broken time from wet during that period. The total number would amount to 126 days, which, deducted from 365, leaves a balance of 239 days. The preceding will in a measure show the difficulty which arises at certain points, thus decreasing the possibility of arriving at correct conclusions as to exact cost of tillage operations. We are of opinion, however, that a careful study of the tables given in this paper will prove of some benefit to the farmers in the counties from which returns have been obtained, as the actual cost of providing the means for the work may be accepted as approximately correct. If the character of the soil, the rainfall, &c., are therefore considered, the farmer can arrive at a pretty near estimate of the number of days horses are at work in his district, and from the data here given can have very little difficulty as to the cost of tillage. We are now in a position to estimate the cost of horse labour per day. The number of days stated is the average of those given in the schedules, and from what has been said in the preceding part of this paper, cannot be looked upon as an over-estimate.

	South-eastern.	South-western.	Central.	North-eastern.	Professor Wrightson.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Food . . .	29 18 9	26 18 10	26 2 6	23 18 5	18 17 0
Tradesmen . .	2 18 0	2 18 0	2 18 0	2 18 0	2 13 3
Depreciation . .	4 0 0	4 0 0	4 0 0	4 0 0	3 0 0
Interest on £40	2 0 0	2 0 0	2 0 0	2 0 0	1 10 0
Requisites . .	0 17 6	0 17 6	0 17 6	0 17 6	1 8 0
	39 14 3	36 14 4	35 18 0	33 13 11	27 8 3
Divide by number of days	259	232	248	230	280
Cost per day . .	3s. 1d.	3s. 2d.	2s. 10d.	2s. 11d.	2s.

We have now to consider the rate of wages and perquisites of the labourer. The returns are not very clear on some points, especially as to single men and women. The rate of wages is

given with board. This board is variously estimated from 5s. to 8s. per week. We have taken it at 6s., and in the case of women and boys as £7 per annum. These figures may be considered low, but they agree with the majority of the sums stated in the schedules. The house is held as part of the farm, and the rent is included in the gross rent of the farm. (See Table II., pp. 282, 283.)

Having now procured sufficient data for calculations, we shall proceed to work out the cost of the various tillage operations. We find the cost of a man and pair of horses per day to be as follows, in the districts already specified :—

	South-eastern.	South-western.	Central.	North-eastern.	Wrightson.
	s. d.	s. d.	s. d.	s. d.	s. d.
2 horses at 3s. 1d.	6 2	6 4	5 8	5 10	4 0
1 man . . .	2 10	2 9	2 9	2 2	2 0
Total . . .	9 0	9 1	8 5	8 0	6 0

For all practical purposes we may assume that the cost in the south of Scotland averages 9s. per day, in the central and north-eastern districts 8s. 6d. and 8s. respectively. It is somewhat curious how those sums have been worked out, as, taking the returns singly, a very considerable difference as to the ultimate cost would appear to be the result. The returns show that horses are more highly fed in the Lothians than in the Galloway district; but this is fully counterbalanced by the wet climate of the latter, and the consequent fewer number of days the horses are at work during the year. The same holds good to a certain extent when the results of the central are compared with the north-eastern district. Professor Wrightson is much under either; and we find that in estimating tillages he puts the sum at 7s. for a man and pair of horses, having added one shilling for wearing of the plough, overlooking the fact that this sum is added to every acre ploughed during the year—that is, 45s. per year for upkeep of plough. Not only this, but he bases all his calculations for other tillages on this amount.

We shall now take up the various tillages in detail and estimate their cost, taking for data of calculations the south of Scotland.

Ploughing.—A man with a pair of horses, in a day of ten hours, going at a speed of $1\frac{1}{4}$ mile per hour, ought to plough an acre of lea, the soil being of a medium character. The cost of this work would average in the south of Scotland 9s. per acre, in the central district 8s. 6d., and towards the north 8s., stubble, turnip-land, and cross-ploughing being dependent on the area turned over and the length of furrow. For in-

stance, in a furrow of 150 yards in length, 2 hours and 44 minutes are occupied in turning; while a furrow of 275 yards would occupy 1 hour and 22 minutes for turnings.

Cultivating.—A man with 3 horses, going at plough pace, ought to cultivate one acre for every 9 inches the implement measures in width. Even supposing horses do not step more quickly in the grubber than in the plough, there is a gain of at least 9 inches every round. Thus a 3-foot grubber would cultivate at least a width of 3 feet 9 inches, which, divided by 9 inches, gives the net area of 5 acres per day, which would cost 2s. 5d. per acre.

Harrowing.—A man with a pair of horses ought to harrow a single time $1\frac{1}{2}$ acre per day for every foot the harrow measures in width, or rather the width of its track. Thus with a track of 9 feet he ought to harrow $13\frac{1}{2}$ acres, and with the zigzag harrow 11 feet, $16\frac{1}{2}$ acres; but no driver is careful enough to accomplish this, as there is always overlapping, so that 12 to 16 acres is a fair day's work. Say 14 acres, cost per acre $7\frac{1}{2}$ d.

Rolling.—A man and horse going at the rate of $2\frac{1}{2}$ miles per hour with a 6-foot roller, would roll 18 acres in a day of ten hours—that is, going continuously, having no turnings, overlappings, or feerings. When time is deducted for these causes, the area will be one-third less: this would give 12 acres. Of course much depends on the physical condition of the soil. This gives a cost of 6d. per acre.

Drilling.—A man with a pair of horses can on an average open and cover $2\frac{1}{2}$ acres of 27-inch drills. This would require quick-stepping horses and an active man, so that 2 acres of 26-inch drills will be about the average in ordinary practice, which would cost 4s. 6d. per acre.

Horse Hoeing or Scuffling.—With an ordinary scuffer which takes one drill, a man and horse will cultivate $4\frac{1}{2}$ acres per day. This work is, however, often performed by boys, so that 4 acres will be about an average extent for the day's work, which would cost 1s. 2d. per acre. When a scuffer is used that takes three drills, drawn by two horses, 10 to 12 acres will be the result of a day's work, and would cost 9d. per acre.

Sowing.—The cost of sowing an acre of corn with a broad-cast machine would be 5s. 11d. per day for man and horse, 1s. $6\frac{1}{2}$ d. for woman to hand the corn, and 2s. to place the corn in the field, giving a total sum of say 9s. 6d. required to sow from 28 to 30 acres of land, which would cost per acre 4d. A double-drill turnip-sowing machine will sow 6 acres daily, and the cost per acre would be 1s.

Cutting Corn.—In cutting corn with a self-binder, we shall first take the cost per acre of man and horses, which will amount to 9s. per day. A machine will cut on an average 8 acres:

this allows a margin for difficulty in cutting a heavy crop. When three sides are cut, more may be accomplished; but we consider 8 acres as a fair average, the cost of which would be 1s. 1d. per acre. To this must be added 2s. per acre for twine and oil, 9d. for stooking, and a sum for tear and wear of machine. On a 500-acre farm one machine would cut about 100 acres. A machine would suffer an annual depreciation of £3, 10s.—that is, spreading the first cost over a period of fifteen years, when the machine would be practically worn done; or the expense of upkeep would amount to a similar sum—the annual renewal of parts and breakages would come to at least 30s.: these sums spread over the 100 acres would amount to a charge of 1s. per acre, making a total of 4s. 10d. per acre. In a few of the schedules a much larger sum is charged for depreciation—2s. 6d. per acre, and an extra charge for horses. This would work out a sum of £12, 10s. per annum for the depreciation, &c., of machine, which is an overcharge. The depreciation on horses has been already charged.

Manual Reapers.—We shall here take the reaper in common use, which requires two men and two horses for the work: a boy is sometimes substituted for one of the men to drive, but the work of putting off, especially in a heavy crop, is very severe, and it is often found better policy to change horses, so that each man drives his own pair, the other putting off the grain from the machine. We have also to add 1s. per day to the ordinary wages for women and boys. As a *bonus* is given during harvest, this would increase the usual rate to 2s. 6d. or 3s. for women and boys who can lift and reap—say 2s. 6d. There will also be a sum of 22s. for depreciation, &c., 10s. for breakages and oil, which, divided over 100 acres, would result in a charge of 6d. per acre. We have first two men and two horses at a cost of 11s. 10d. per day; tear and wear on machine, and oil; cutting 7 acres at 6d. per acre, equal to 3s. 6d.: these items give a total of 2s. 2d. per acre for cutting.

Stooking and binding would require 7 lifters and 2 stookers. As a man would be required to cut off corners and lying parts, the gross earnings of these would amount to 3s. 4d. per acre, making a total of 5s. 6d. per acre for cutting, binding, and stooking. These sums represent the actual cost where no difficulty occurs as to the character of the crop, it being understood that it is fairly standing, and would thresh between 5 to 6 quarters per acre. We are aware that food and beer is provided in the harvest-field, but consider the extra hours worked should compensate the farmer for his outlay on these items. Raking is now done by a rake attached to the machine.

Hauling, Building, &c.—The cost of this work altogether depends upon the weight of the crop and its average distance from the stackyard. We shall, in the first place, assume that

2 horses will cart as much grain from a field $\frac{1}{4}$ mile distance from the yard as will keep an active man building on the stack. A builder will on an average during a day of ten hours build two stacks of a medium crop, which will thresh from 14 to 15 imperial quarters each. This quantity would represent the produce of from 5 to 6 acres. We may therefore infer that 2 men, 2 horses, 1 forker, and $1\frac{1}{2}$ builder (an extra man being allowed in the yard for every three stackers) will clear, carry, and build 5 acres. The sum required will be 5s. 8d. per day for men, 6s. for horses, 2s. 6d. for forking, 4s. 6d. for building, with 8d. per day, for tear and wear of carts; this sum being arrived at by taking the average number of days the cart is at work during the year, and dividing the amount for depreciation, interest, and upkeep by it. Say a cart is on an average 127 days at work during the year, and the charge 20s. for depreciation, and 25s. for upkeep, interest, grease, &c., we find the result to be nearly 4d. These items work out a total of 3s. 9d. per acre.

If the distance is greater, then an extra horse and cart and boy will be required, which would increase the preceding sum to 4s. 10d. per acre.

Threshing and Carting to Market.—When the mill is driven by water, the number of hands required to thresh $3\frac{1}{2}$ to 4 stacks, in a day of ten hours, will be 5 men, divided as follows—1 feeding, 2 carting from stack, 1 forking, 1 clearing away straw; and 3 women unbinding sheaves and clearing door, 1 clearing corn, and 1 packing straw. The two latter may not be required where a large barn capable of holding the straw of two stacks is part of the farm buildings. Otherwise the straw requires packing, so that the mill be kept threshing 5 hours. Elevators are also, in many instances, attached to the mill, which clear away the corn; but these conveniences are not in general use. Women may be also substituted for men in the straw-barn and forking the stack. Calculating on the preceding lines, we have 5 men, whose average wage will amount to 14s. 4d. per day; 5 women, 7s. 6d.; 2 horses, 6s.; depreciation of two carts, 8d.; and £5 per year for upkeep of mill: this equals 5s. per day, as threshing 50 quarters per day would take 20 days to thresh the produce of 200 acres at 5 quarters per acre. These sums give 7 $\frac{1}{2}$ d. per quarter when divided by 50 quarters, the average quantity threshed per day, or 3s. 2d. per acre. When steam-power obtains, extra charges must be made for man firing engine, &c., say 3s. 6d., coals 7s., water-carrying 3s., and upkeep of engine and mill, say 12s., or 1s. 1d. per quarter, equal to 5s. 5d. per acre. Carting grain, a man and pair of horses can carry 10 quarters of grain a distance of 6 miles outward, and 6 miles inward, in one half day, or 5 hours, or 4s. 10d. per acre. Portable steam-mill, 1s. 6d. per quarter.

Average Cost of Harvesting—

	s.	d.
Cutting	2	2
Reaping and stooking	3	4
Hauling and stacking	4	10
Equal per acre	10	4
To which has to be added for thatching	1	2
Giving a total per acre of	11	6

Thinning or Singling Turnips.—The area of turnip singled per day depends on the age of the plants, the width of drills, distance of plants apart, and character of the soil: with these favourable, a good hand at hoeing ought to get over an acre of land in 26 to 27 hours; but this cannot be taken as an average, as 30 hours would be required by average hoers. It is not good policy to hurry when singling turnips, as plants are apt to be knocked out where they should remain, and a blanky crop is the result. We would in consequence allow 3 hoers to single an acre per day, which would cost 4s. 6d.

Pulling, topping, and tailing may be done from 9d. to 1s. per acre cheaper.

Harvesting Turnips.—When a sufficient breadth of turnips has been pulled and ready for carting, by placing the contents of four drills in rows along the field, if they are to be carted to the steading the most economical way is to have 8 carts and horses, 5 men and 4 women, divided as follows: 3 women with driver of carts to load up, a cart being placed between 2 rows; one man and one woman at the turnip shed or yard, to trim up and place old thatch on the heap if the turnips are placed in the yard. This entails an outlay of 24s. for horses, 2s. 8d. for deterioration on carts, 15s. for men, and 6s. for women, for which $4\frac{1}{2}$ acres of a medium crop can be cleared, or 10s. 7d. per acre.

When pitted in the field where grown, in heaps of say 14 loads, 4 horses, 3 men, 5 women will clear about $3\frac{1}{2}$ acres of a fair crop at an outlay of 12s. for horses, 9s. for men, 7s. 6d. for women, and 1s. 4d. for deterioration on carts. The heaps may be thatched at about 1s. per acre, so that it works out a total of 12s. per acre.

Spreading Dung.—We shall assume that the dung has been carted during winter to the end of the field where it is to be applied, and that the application is at the rate of 16 cart-loads per acre to the turnip crop. The force required to keep 3 ploughs opening and covering will be as follows: 2 men and 1 woman filling at dung-heap, 2 men pitching out dung in drills, and 4 women spreading, with 4 carts driving when field is wide, and 3 when the distance will allow the work to be done without stoppage. Of course the old-fashioned method may be

adopted, of a man hacking out the dung for three drills, a woman dividing, and three spreaders. The outlay is about the same, but the work is not done so well, as in the one case we have four spreaders and by the latter three, and we are well aware that the chief difficulty is to have well and evenly spread dung when people are all driving each other at work of this kind. This entails a total outlay of 22s. 10d. for 6 acres, giving a result of 3s. 9d. per acre.

We shall now append a table (see Table III., pp. 284, 285) showing the average cost of tillages in the several counties from which we have obtained returns, with the writers' estimates based upon the data given in the preceding portion of this paper for each district. The latter estimates do not include any outlay for supervision. The south-eastern and south-western are treated as one district, the central and north-eastern are given separately. We may say that the calculations are based upon the averages of the returns of each county, altered in accordance with the quantity specified as the work of ten hours.

We regret being unable to follow out to the natural finish the various tillage operations—that is, to try and estimate the cost of each crop in an ordinary rotation. The data here given may be of service in this direction, but every farmer is aware that these estimates are of an elastic description, and must be expanded or contracted to suit the various circumstances of climate, soil, and crop.

We shall now conclude with a few noteworthy remarks which appear in some of the returns.

Mr Blaikie, Holydean, Roxburgh, remarks: "The expenses of cultivating any farm depends much on its physical features and characteristics. In many cases my figures will appear too low, in others high."

Mr Scott of Mersington, Berwick, gives the following estimate of expense incurred in manufacturing 10 acres of an average crop of grain:—

Cutting, &c.	.	.	.	.	£4 10 0
Leading	.	.	.	.	2 5 0
Thatching	.	.	.	.	0 16 0
Threshing—					
Cartage to barn	.	.	.	£0 18 0	
Engine-firing	.	.	.	0 3 6	
Coal	.	.	.	0 7 0	
Feeding mill	.	.	.	0 7 0	
Straw-carrying	.	.	.	0 6 0	
Chaff do.	.	.	.	0 1 6	
Mill	.	.	.	0 15 0	
Carting to station, &c	.	.	.	1 16 0	
					4 14 0
Or a total of	.	.	.	.	£12 5 0
Averaging per acre	.	.	.	.	1 4 6

Mr Wilson, Chapelhill, Haddington, remarks : " Ploughing land, when done by an outgoing tenant and fixed by arbitration, runs from 10s. to 12s., depending on soil and quality of work. The whole manufacturing of crops, from cutting to delivery, is fixed by arbitration at from 20s. to 30s., but is always fixed on the liberal side, to cover risks. I think 23s. will cover the average outlay."

Mr Elliot, Hollybush, Selkirk, remarks : " Upon looking over my accounts, I consider this a very moderate estimate, and there would be no harm in adding 10 per cent to the various prices, not the wages."

Mr Sproat, Borgue House, Kirkcudbright, remarks : " You will notice an acre of oats cost about £4 before it is finished with, and on an average this county will not produce over 36 bushels per acre, so there is not much for rent, and profit—*nil*."

Mr G. N. Paterson, Thankerton, remarks : " It is an old saying that 'if we count the cost we would not yoke the plough,' and I am sure the details here given will fully justify this saying. In a high-lying district such as this—700 feet above sea-level—and corn at such a low price, every acre broken is at a loss of from 20s. to 30s., unless on the very best of land. Grass gets worse every year after the third. In this case we must plough, or incur greater loss. . . . With corn at present prices, importation of beef and mutton on such a large scale, with wages rising, the arable farmers of the Upper Ward of Lanark have but a poor look-out."

Mr W. S. Ferguson, Pictstonhill, Perthshire, remarks : " Probably the item where there is most room for variation is the cost of harvesting, because so much depends on the weight and condition of the crop, weather, &c. I have worked a self-binder for five years, and have found it very handy for a medium crop, but often unworkable amongst heavy and twisted or laid grain. Counting the extra horse labour, twine, oil, &c., the actual saving is not so very great where harvest hands are plentiful."

Mr Murray, Munniston, Stirling, remarks : " The seed ploughing is calculated as being done by the Scotch plough ; it can be done at *one-third less* cost with the chill plough. The only hindrance to the universal adoption of the latter is the want of a good drill sowing-machine."

Mr Paterson, Plean Farm, Stirling, remarks : " Fifteen years ago the amount of work done per day was considerably more than the prices in schedule, but of late our men will not push on as they did when wages were much lower."

Mr Milne, Mains of Laithers, Aberdeenshire, in remarking on the cost of harvesting, says : " The average length of day in the field in Aberdeenshire is six and a half hours, so that

damp weather increases the cost 50 per cent, while in wet and windy seasons much of the work has to be done twice. I have frequently estimated the difference in cost between harvesting in our damp climate and that of Central Europe or North America, including damage done to colour of grain and quality of straw, at over 20s. per acre in favour of the dry climate."

We have now to thank most sincerely the gentlemen who were good enough to send in the returns. Much more might be said on this subject of tillage, but time won't admit of entering further on the matter. The subject is a most complicated one, and it would require more study and brains to elucidate it than are at the disposal of the writer.

TABLE II.—WAGES OF THE LABOURERS.
SOUTH-EASTERN DISTRICT.

	Roxburgh.		Berwick.		Haddington.		Edinburgh.		Peebles.		Selkirk.		Linlithgow.		Average per day.
	Per- quisites.		Per- quisites.		Per- quisites.		Per- quisites.		Per- quisites.		Per- quisites.		Per- quisites.		
	Money.	£ s.	Money.	£ s.	Money.	£ s.	Money.	£ s.	Money.	£ s.	Money.	£ s.	Money.	£ s.	
Married men	16 0	26 10	£ s. 24 10	£ s. 23 10	£ s. 40 0	£ s. 8 0	£ s. 36 0	£ s. 9 0	£ s. 33 0	£ s. 12 0	£ s. 20 0	£ s. 38 0	£ s. 38 0	£ s. 7 10	d. 2 10
Single men	38 0	...	42 0	...	50 0	...	24 0	15 12	24 0	15 12	22 0	30 0	15 12	2 8	2 8
Boys .	8s. per week	...	9s. per week	...	9s. per week	...	1s. 4d.	per day	1s. 3d.	per day	1s. 5d.	per day	14 0	7 0	1 4½
Women .	9s. per week	...	9s. per week	...	9s. per week	...	1s. 6d.	per day	1s. 6d.	per day	1s. 7d.	per day	18 0	7 0	1 6½

SOUTH-WESTERN DISTRICT.

	Dumfries.		Kirkcudbright.		Wigtown.		Lanark.		Dumbarton.		Average per day.
	Per-quisites.		Per-quisites.		Per-quisites.		Per-quisites.		Per-quisites.		
	Money.	£ s.	Money.	£ s.	Money.	£ s.	Money.	£ s.	Money.	£ s.	
Married men .	42 0	...	41 0	...	25 0	15 0	47 0	...	48 0	...	s. d. 2 9
Single men .	21 0	15 12	19 0	15 12	39 0	...	27 0	15 12	30 0	15 12	2 6
Boys .	12 0	7 0	11 0	7 0	12 0	7 0	15 0	7 0	12 0	7 0	1 3
Women .	16 0	7 0	17 0	7 0	16 0	7 0	17 0	7 0	20 0	7 0	1 6

CENTRAL DISTRICT.

	Stirling.		Perth.		Fife.		Forfar.		Kincardine.		Average per day.
	Money.	Per-quisites.	Money.	Per-quisites.	Money.	Per-quisites.	Money.	Per-quisites.	Money.	Per-quisites.	
Married men . .	£ s. 26 0	£ s. 18 0	£ s. 28 0	£ s. 15 0	£ s. 27 0	£ s. 16 0	£ s. 30 0	£ s. 15 0	£ s. 27 0	£ s. d. 15 15 6	s. d. 2 9
Single men . .	30 0	12 0	28 0	15 12	40 15	...	45 0	...	28 0	15 0 0	2 8
Boys . .	14 0	7 0	15 0	7 0	25 10	...	1s. 6d. per day		16 0	7 0 0	1 5
Women . .	16 0	7 0	17 0	7 0	21 0	7 0	1s. 6d. per day		1s. 3d. per day		1 5

NORTH-EASTERN DISTRICT.

	Aberdeen.		Banff.		Elgin.		Nairn.		Ross.		Caithness.		Orkney.		Average per day.
	Money.	Per-quisites.	Money.	Per-quisites.	Money.	Per-quisites.	Money.	Per-quisites.	Money.	Per-quisites.	Money.	Per-quisites.	Money.	Per-quisites.	
Married men	£ s. 24 0	£ s. 14 0	£ s. 26 0	£ s. 10 0	£ s. 24 0	£ s. 10 10	£ s. 24 0	£ s. 10 0	£ s. 19 0	£ s. 12 0	£ s. 13 0	£ s. 19 12	£ s. 18 0	£ s. 12 0	s. d. 2 2
Single men	26 0	10 4	15s. per week	...	32 0	...	25 0	8 0	29 10	...	18 0	14 10	18 0	10 0	2 3
Boys . .	14 0	7 0	14 0	7 0	26 0	...	14 0	7 0	19 0	...	12 0	7 0	10 0	7 0	1 4
Women . .	14 0	7 0	13 0	7 0	22 0	...	12 0	7 0	18 0	...	12 0	7 0	10 0	7 0	1 3

TABLE III.

SOUTHERN DISTRICTS.																															
	Number of Acres per day.	Writer's Estimate.	Roxburgh.		Berwick.		Haddington.		Edinburgh.		Linlithgow.		Peebles.		Selkirk.		Kirkcudbright.		Dumfries.		Wigtown.		Lanark.		Dumbarton.						
			s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.			
Ploughing lea	Ac.	7	10	3	11	5	12	7	11	5	17	1	15	3	12	7	12	0	11	5	12	0	12	0	16	0	17	1			
Stubble	1	9	0	10	0	11	0	10	0	15	0	13	4	11	0	10	6	10	0	10	6	10	6	10	6	14	0	15	0		
Turnip land	1½	7	0	8	0	8	10	8	0	12	0	10	8	8	10	8	5	8	0	8	5	8	5	11	2	12	0	12	0		
Cross-ploughing	1½	6	0	6	8	7	4	6	8	10	0	8	10	7	4	7	1	6	8	7	1	7	1	9	4	10	0	10	0		
Cultivating	5	2	9	2	8	3	0	2	8	4	0	3	8	3	0	2	9	2	8	2	9	2	9	2	9	4	10	0	10	0	
Harrowing (single)	14	0	7½	0	8½	0	9½	0	8½	1	1	0	11½	0	9½	0	9	0	8½	0	9	0	9	0	9	1	1	1	1	1	
Rolling (1 horse)	12	0	6	0	6½	0	7½	0	6½	1	9½	0	8	0	7½	0	7	0	6½	0	7	0	7	0	7	0	7	0	7	0	
Drilling (open and cover)	2	4	6	5	0	5	6	5	0	7	6	6	6	8	5	6	5	3	5	0	5	3	5	3	5	3	7	0	7	0	
Horse-hoeing	4	1	2	1	7½	1	9	1	7½	2	4	2	2	1	1	9	1	8	1	7½	1	8	1	8	2	1	2	4	1	2	4
Sowing (drill)	10	1	6	1	4	1	5	1	4	1	10	1	8	1	5	1	4½	1	4	1	4½	1	4½	1	4½	1	9	1	10	1	
Broadcast	28	0	4	0	5	0	6	0	6	0	8	0	7	0	6	0	5	0	6	0	5	0	5	0	5	0	7	0	8	0	
Sowing turnip	6	1	0	1	1	1	2	1	0	1	7	1	4½	1	2	1	2	1	0	1	2	1	2	1	2	1	7	1	7	1	
Cutting corn	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Self-binding	8	4	10	5	8	6	3	...	...	5	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Manual cutting	7	2	2	2	2	7	8	7	0	8	2	5	4	5	6	5	9	6	6	6	8	6	3	6	3	6	9	6	9	6	9
Stooking and binding	7	3	4	6	0	4	6	5	0	4	6	4	0	5	0	4	2	4	6	4	6	4	6	4	6	4	6	4	6	4	6
Hauling and building	5	3	9	4	6	15	0	15	0	16	2	14	0	14	0	15	0	15	0	14	0	14	0	15	0	15	6	15	8	15	8
Average of harvesting	1	*12	6	13	0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

* One shilling per acre allowed for setting up stocks, &c.

	Number of Acres per day.	CENTRAL DISTRICT.				NORTH-EASTERN DISTRICT.											
		Writer's Estimate.				Writer's Estimate.											
		Stirling.	Perth.	Fife.	Forfar.	Kincardine.	Aberdeen.	Banff.	Elgin.	Nairn.	Ross.	Cathness.	Orkney.				
Ac.	s.	p.	s.	p.	s.	p.	s.	p.	s.	p.	s.	p.	s.	p.	s.	p.	
Ploughing lea	9	8	12	7	14	4	11	5	11	5	13	8	11	5	15	0	11
Stubble	1	8	11	0	12	6	10	0	10	0	12	0	10	0	13	0	10
Turnip land	1	7	8	10	10	0	8	0	8	0	9	7	8	0	10	4	8
Cross-ploughing	5	8	7	4	8	0	6	8	6	8	5	8	6	5	10	4	8
Cultivating	3	0	3	0	3	6	2	8	2	8	3	6	2	8	3	7	3
Harrowing (single)	14	0	9	0	11	0	8	0	8	0	10	0	8	0	11	0	8
Rolling (1 horse)	12	0	6	0	7	1	0	6	1	0	6	0	5	0	6	0	5
Drilling (open and cover)	2	4	3	5	6	3	5	0	5	0	6	0	5	0	6	5	0
Horse-hoeing.	4	1	4	1	9	2	0	1	7	1	10	1	10	1	7	1	4
Sowing (drill)	10	1	2	1	5	1	7	1	4	1	6	1	6	1	4	1	1
Broadcast	28	0	4	0	6	0	6	0	5	0	6	0	6	0	5	0	7
Sowing turnip	6	0	1	2	1	3	1	0	1	0	1	3	1	0	1	4	0
Cutting corn	9	1	2	1	3	1	0	1	1	0	10	1	3	1	0	10	0
Self-binding	8	4	10	5	6	7	0	5	3	6	5	8	5	9	5	10	...
Manual cutting	7	5	0	6	5	7	0	4	9	6	8	6	8	6	6	10	...
Stooking and binding	7	3	6	6	0	5	0	5	0	6	6	5	0	6	0	7	4
Hauling and building	5	12	0	14	0	15	0	15	9	15	0	14	4	16	0	14	0
Average of harvesting	1	12	0	14	0	15	0	14	0	15	0	14	4	16	0	14	0

APPENDIX (A).

PROCEEDINGS AT BOARD MEETINGS.

MEETING OF DIRECTORS, 5TH FEBRUARY 1890.

Present.—Mr M'Queen of Crofts, *Vice-President*, in the Chair. *Ordinary Directors*—Mr Buttar, Corston; Mr Glendinning, Hatton Mains; Mr Elliot of Wolfelee; Mr Buchanan, Garscadden Mains; Sir Jas. H. Gibson-Craig of Riccarton, Bart.; Mr Marr, Cairnbrogie; Rev. John Gillespie, Mouswald Manse; Mr Ballingall, Dunbog; Mr Ford, Fentonbarns; Mr Shirra Gibb, Boon; Mr Gilmour of Montrave; Mr Fisher, Jellyholm; Mr Wardlaw Ramsay of Whitehill; Mr Lockhart, Mains of Airies; Mr Cran, Kirkton; the Hon. The Master of Polwarth. *Extraordinary Directors*—Sir Alex. Muir Mackenzie of Delvine, Bart.; Captain Clayhills Henderson of Invergowrie, R.N.; Sir Robt. Menzies of Menzies, Bart.; Mr Kerr, Broomhouse; Mr Murdoch, Garterraig. *Hon. Secretary*—Sir G. Graham Montgomery of Stanhope, Bart. *Chemist*—Dr A. P. Aitken. *Auditor*—Mr William Home Cook, C.A. *Engineer*—Mr Jas. D. Park.

Mr F. N. MENZIES reported apologies for the absence of Hon. R. Baillie Hamilton; Sir Wm. S. Walker, K.C.B.; Mr Allan, Munnoch; Mr Ballingall, Dundee; Mr Forbes of Culloden; Mr Dingwall, Ramornie; Mr Dudgeon, yr. of Cargen; Mr Findlay of Easterhill; Mr Lumsden of Balmedie; Mr Macduff of Bonhard; Mr Mackenzie of Portmore; Mr Mackenzie, Dalmore; Mr Maxwell, yr. of Munches; Mr Middleton, Clay of Allan; Mr Ralston, Glamis House; Mr Walker, Portlethen; Mr Whitton of Couston; Mr Wilken, Waterside of Forbes.

SUBSCRIPTIONS IN AID OF GENERAL SHOW.

Mr GILLESPIE moved, seconded by Mr ELLIOT of Wolfelee—"That a committee be appointed to take such steps as they may consider desirable to ascertain what pecuniary support in the form of voluntary subscription or otherwise can be got from the district should the Society resolve to hold its General Show at Stirling in 1891." Mr Gillespie explained that he considered this step necessary owing to the partially moribund state of the Commissioners of Supply, who had for many years laid on a voluntary assessment in aid of the Society's Show. The motion was agreed to unanimously.

GLASGOW TECHNICAL COLLEGE.

A letter was read from Mr Young, secretary of the College, applying for a renewal of the grant from the Society of £100. After considerable discussion, during which it was moved that the grant be reduced to £50, it was ultimately decided to limit the grant to that sum.

PLEURO-PNEUMONIA.

A letter was read from Captain Steuart of Westwood, drawing attention to the present system of working the Contagious Diseases (Animals) Act, and referring to the unfair and unsatisfactory arrangement by which a Local Authority was called upon to slaughter and give compensation for cattle so slaughtered when the disease had been brought in within the area of the Local Authority contrary to the regulations in force by said authority. The Board considered that as the Local Authority was in a transition state it was not desirable to express any opinion on the subject.

BOOKS PRESENTED TO THE SOCIETY.

The following volumes—viz., 'The Polled Herd-Book,' vol. xiv., and 'The Hunters' Improvement Society,' vol. iii.—were laid on the table, and the Secretary was instructed to convey the Directors' thanks for the same.

MEETING OF DIRECTORS, 5TH MARCH 1890.

Present.—*Vice-Presidents*—Mr M'Queen of Crofts; Mr Middleton, Clay of Allan. *Ordinary Directors*—Mr Buttar, Corston; Mr Stirling of Kippendavie; Mr Dudgeon, yr. of Cargen; Mr Mackenzie, Dalmore; Sir James H. Gibson-Craig, Bart.; Rev. John Gillespie, Mouswald; Sir James R. Maitland, Bart.; Mr Ballingall, Dunbog; Mr Ford, Fentonbarns; Mr Shirra Gibb, Boon; Mr Findlay of Easterhill; Mr Wardlaw Ramsay of Whitehill; Mr Lockhart, Mains of Airies; Mr Cran, Kirkton; the Hon. the Master of Polwarth. *Extraordinary Directors*—Mr Ballingall, Dundee; Mr Dingwall, Ramornie; Mr Ralston, Glamis House; Sir Robert Menzies, Bart.; Mr Villiers of Closeburn Hall; Mr Murdoch, Garteraig; Mr Howatson of Glenbuck. *Honorary Secretary*—Sir G. Graham Montgomery, Bart. *Chemist*—Dr A. P. Aitken. *Auditor*—Mr William Home Cook, C.A. *Engineer*—Mr James D. Park. Mr M'Queen in the chair.

Mr F. N. MENZIES reported apologies for the absence of the Earl of Strathmore; the Hon. R. Baillie Hamilton; Mr Allan, Munnoch; Mr Ogilvy Dalgleish of Errol Park; Mr Elliot, Hollybush; Mr Fisher, Jellyholm; Mr Gilmour of Montrave; Captain Clayhills Henderson of Invergowie; Mr Macduff of Bonhard; Mr Maxwell, yr. of Munches; Mr Walker, Portlethen; Mr Whitton of Couston; and Mr Wilken, Waterside of Forbes.

THE LATE LORD LAMINGTON.

Before proceeding to the business on the programme, the Directors resolved to record their deep regret at the loss which the Society has sustained by the death of the Right Hon. Lord Lamington, who was for forty-eight years a member of the Society, and their sense of the assistance rendered by him as an Extraordinary Director and as Convener of District Committees.

CHEMICAL DEPARTMENT.

The units by which the value of manures is to be obtained were submitted and approved of.

AGRICULTURAL EDUCATION.

The date of examinations was arranged for the 26th, 27th, and 28th of March.

DUNDEE SHOW.

Committees were appointed for various matters.

SHOW 1891.

A report of a meeting of district Directors, held at Stirling on 28th February, for the purpose of arranging how auxiliary funds should be raised in event of the Society's Show being held at Stirling next year, was submitted and approved. The report suggested that district conveners should be appointed to form committees to raise subscriptions, as the old system of voluntary assessment cannot now be well carried out by the County Councils. The Directors remitted to the committee to carry out their suggestions.

RAILWAY RATES INQUIRY.

The Committee in charge of this subject reported that they had unanimously resolved to join the Lord Provost's Committee, but had reserved right to bring forward witnesses or questions specially affecting agriculture if they thought necessary.

CLYDESDALE STUD-BOOK.

Volume xii. was presented by the Clydesdale Horse Society, and the Secretary was instructed to return thanks.

MEETING OF DIRECTORS, 2D APRIL 1890.

Present.—*Vice-Presidents*—Colonel Anstruther Thomson of Charleton; Mr M'Queen of Crofts; Mr Middleton, Clay of Allan. *Ordinary Directors*—Mr Buttar, Corston; Mr Park, Dechmont; Mr Elliot, Hollybush; Mr George R. Glendinning, Hatton Mains; Mr Elliot of Wolfelee; Mr Buchanan, Garscadden Mains; Mr Mackenzie, Dalmore; Sir James H. Gibson-Craig, Bart.; Mr Marr, Cairnbrogie; Rev. John Gillespie, Mouswald; Mr Turner, The Dean; Mr Ballingall, Dunbog; Mr Ford,

Fentonbarns; Mr Lumsden of Balmedie; Mr Maxwell, yr. of Munches; Mr Shirra Gibb, Boon; Mr Findlay of Easterhill; Mr Gilmour of Montrave; Mr Fisher, Jellyholm; Mr Wardlaw Ramsay of Whitehill; Mr Wilken, Waterside of Forbes; Mr Lockhart, Mains of Airies; Mr Cran, Kirkton. *Extraordinary Directors*—Mr Ballingall, Dundee; Captain Clayhills Henderson of Invergowrie, R.N.; Mr Whitton of Couston; Sir Robert Menzies of Menzies, Bart.; Mr Kerr, Broomhouse; Mr Elliot, Blackhaugh; Mr Murdoch, Garterraig; Mr Allan, Munnoch. *Chemist*—Dr A. P. Aitken. *Auditor*—Mr Wm. Home Cook, C.A. *Engineer*—Mr Jas. D. Park. Col. Anstruther Thomson and afterwards Mr M'Queen in the chair.

Mr F. N. MENZIES reported apologies for the absence of the Earl of Strathmore; the Hon. R. Baillie Hamilton; Sir G. Graham Montgomery, Bart.; Mr Ogilvy Dalgleish of Errol Park; Mr Dudgeon, yr. of Cargen; Mr Forbes of Culloden; Mr Macpherson Grant of Drumduan; Mr Macduff of Bonhard; Mr Mackenzie of Portmore; Mr Ralston, Glamis House; Mr Stirling of Kippendavie; Mr Villiers of Closeburn Hall; and Mr Walker, Portlethen.

Before proceeding with the business on the programme, the following resolutions were unanimously adopted:—

THE LATE SIR JOHN OGILVY, BART.

That the Directors regard it as a sad duty to enter on the records with sincere sorrow the melancholy death of Sir John Ogilvy of Inverquhar, Bart., and their cordial sense of the benefits the Society derived from his assistance in its affairs during a period of sixty-six years. Sir John was elected a member of the Society in 1824, and was at the time of his death the father of the Society. He filled the office of Ordinary and Extraordinary Director on several occasions, and acted as Convener of the Local Committee for the Dundee Show in 1843. At the first general meeting thereafter he received the thanks of the Society for his unsparing exertions on behalf of the objects of that show. At the request of the Directors he again accepted office, and was an Extraordinary Director at the time of his death.

THE LATE ADMIRAL MAITLAND DOUGALL.

That the death of Admiral Maitland Dougall, R.N., of Scotsraig, having been communicated to the Directors of the Highland and Agricultural Society, they resolve to enter on the minutes an expression of the sense of the loss which the Society has sustained by his death, and as a mark of the value they attach to his services for a period of thirty-three years, during eleven of which he discharged the duties of the office of Chairman of the Argyll Naval Fund in a manner to command the esteem of every one connected with the Institution.

AGRICULTURAL AND FORESTRY EDUCATION.

The Reports of the Agricultural and Forestry Examinations were submitted, showing that the written examinations were held on the 26th and 27th, and the oral on the 28th March. The number of candidates who presented themselves was 15—viz., 14 in agriculture, and 1 in forestry. The examinations resulted in 5 passing for the diploma, 4 for the first-class certificate in agriculture, and 1 for the first-class certificate in forestry.

DUNDEE SHOW.

Mr Gilmour of Montrave was appointed Convener of Local Committee. The Secretary was instructed to send circulars to the Conveners of the counties of Forfar, Fife, Perth, Kinross, and the Lord Provost of Dundee as to the appointment of Local Committee. The following gentlemen were appointed Stewards of the Show: *Horses*—Mr Mackenzie, yr. of Kintail. *Cattle*—Rev. John Gillespie. *Sheep, &c.*—Mr Elliot, Hollybush. *Forage*—Mr Buttar, Corston. *Implements*—Messrs Middleton and Kerr.

RAILWAY RATES INQUIRY.

Rev. JOHN GILLESPIE, Convener of Committee, reported that with much trouble the Committee had arranged the evidence to be led before the Board of Trade Commission, and hoped that the manner in which the case for agriculturists had been conducted would meet with the approval of those interested, and be beneficial to the agricultural interests. The Committee were at present engaged, as requested by Lord Balfour, in drawing up a scheme of maximum rates for live stock and dairy produce.

ACIDITY IN MILK.

It was arranged that the trial of the apparatus for testing acidity in milk should take place at Kilmarnock Dairy School on Tuesday, 8th April, commencing at 8.30 A.M.

A WORTHLESS MANURE.

The Directors resolved to publish the following excerpt from the minutes of the Chemical Committee. "The Committee had under their notice a purchase made by a member of the Society, of a substance called 'Phosphate fish-bone guano,' supplied through agents by a company styling itself 'The Phosphate Fish-Bone Guano Company.' Two samples of this substance have been analysed by the chemist, and he reports that it is chiefly composed of sand, with only a sprinkling of phosphate and nitrogenous matter. It is sold at £3, 10s. per ton—about ten times its manurial value. Considering how widely this manure has been advertised, and that its beneficial properties are ludicrously exaggerated, the Chemical Committee consider it a public duty to call attention to the worthlessness of the manure."

BOOKS PRESENTED TO THE SOCIETY.

Volume x. of the 'Galloway Herd-Book,' and a 'Report of Observations of Injurious Insects and Common Farm-Pests during 1889,' by Miss Eleanor A. Ormerod, were laid on the table, and the thanks of the Society recorded for the same.

MEETING OF DIRECTORS, 7TH MAY 1890.

Present.—*Vice-Presidents*—Mr M'Queen of Crofts; Mr Middleton, Clay of Allan. *Ordinary Directors*—Mr Buttar, Corston; Mr Glendinning, Hatton Mains; Mr Macduff of Bonhard; Mr Ballingall, Dunbog; Mr Ford, Fentonbarns; Mr Gilmour of Montrave; Mr Wardlaw Ramsay of Whitehill; Mr Cran, Kirkton. *Extraordinary Directors*—Sir Alex. Muir Mackenzie of Delvine, Bart.; Mr Ballingall, Dundee; Captain Clayhills Henderson of Invergowrie; Mr Ogilvy Dalgleish of Errol Park; Sir Robert Menzies of Menzies, Bart.; Mr Walker, Portlethen. *Chemist*—Dr A. P. Aitken. *Engineer*—Mr J. D. Park. Mr M'Queen in the chair.

Mr F. N. MENZIES reported apologies for the absence of the Earl of Strathmore; the Hon. R. Baillie Hamilton; Sir G. Graham Montgomery, Bart.; Sir W. S. Walker, K.C.B.; Mr Dingwall, Ramornie; Mr Elliot of Wolfelee; Mr Elliot, Hollybush; Mr Gibb, Boon; Rev. John Gillespie, Mouswald; Mr Howatson of Glenbuck; Mr Jas. Auldjo Jamieson, W.S.; Mr Kerr, Broomhouse; Mr Lockhart, Mains of Airies; Mr Lumsden of Balmedie; Mr Mackenzie, Dalmore; Mr Murdoch, Gartcraig; Mr Stirling of Kippendavie; Mr Villiers of Closeburn Hall, and Mr Whitton of Couston.

Before proceeding to the business on the programme, the following resolutions were unanimously agreed to:—

THE LATE EARL OF GLASGOW.

That the death of the Right Hon. the Earl of Glasgow having been communicated to the Directors of the Highland and Agricultural Society, they resolved to enter in the minutes an expression of their sincere regret for his loss. The late Earl joined the Society in 1854. He served as a Vice-President 1866, 1867, 1875, and 1882, and was ever willing to aid in furthering the objects of the Society.

THE LATE MR FARQUHARSON OF HAUGHTON.

On the death of Mr Farquharson of Haughton being intimated to the Directors of the Highland and Agricultural Society, they resolved to record in the minutes an expression of their deep regret for his loss. Mr Farquharson joined the Society in 1857, and served with much acceptance as an Ordinary Director during the years 1883, 1884, 1885, and 1886.

In bringing forward the resolutions, Mr MENZIES mentioned that the late Earl of Glasgow's father, who died in 1843, was the last of the declared original Constituent Members of the Society; and that an ancestor of the late Mr Farquharson was also one of the original members, and acted as an auditor of the accounts to the Society in the early part of the present century.

Letters were read from Lord Lamington and Sir Reginald Ogilvy, Bart., thanking the Directors for resolutions of sympathy on the deaths of the late Lord Lamington and the late Sir John Ogilvy, Bart.

GENERAL MEETING.

The General Meeting was fixed to be held on 18th June.

DUNDEE SHOW.

Working Dairy.—It was arranged that a working dairy should be carried on during the Show by the Carse of Gowrie Dairy Co., and it was remitted to a committee to arrange the matter.

Contagious Diseases.—It was remitted to a committee to communicate with the Local Authorities of Dundee and Forfarshire with regard to the regulations for animals coming to and returning from Dundee Show.

Apiarian Exhibition.—A letter from Mr R. Steele, Newport, Dundee, with reference to exhibiting bees, was submitted, and the Secretary was instructed to endeavour to make arrangements for such an exhibition.

Eastern Club, Dundee.—A letter was read from Mr Mackay, Secretary of the Club, intimating that the committee would be glad if the Directors, Secretary, and Treasurer of the Society would take advantage of the privilege of the Club as honorary members during the four days of the Show. The Secretary was instructed to intimate acceptance of the offer, and to convey the best thanks of the Directors.

PUBLICATIONS.

The second volume of the fifth series of the 'Transactions' of the Society was submitted, and the Secretary reported that the issue to members would commence in about ten days.

WOLSELEY SHEEP-SHEARING MACHINE COMPANY.

A letter was read from Mr Mackie, of the above Company, requesting the Secretary to bring under the notice of the Directors the Wolseley sheep-shearing machine, and sending drawings, description, testimonials, and opinions of the press. The Directors expressed a favourable opinion of the machine.

MEETING OF DIRECTORS, 4TH JUNE 1890.

Present.—Mr Middleton, Clay of Allan, *Vice-President*, in the chair. *Ordinary Directors*—Mr Buttar, Corston; Mr Macpherson Grant of Drumduan; Mr Glendinning, Hatton Mains; Sir James H. Gibson-Craig, Bart.; Mr Mart, Cairnbrogie; Rev. John Gillespie, Mouswald; Mr Macdull of Bonhard; Mr Ballingall, Dunbog; Mr Ford, Fentonbarns; Mr Lunnsden of Balmedie; Mr Maxwell, yr. of Munches; Mr Forbes of Culloden; Mr Shirra Gibb, Boon; Mr Findlay of Easterhill; Mr Gilmour of Montrave; Mr Fisher, Jellyholm; Mr Wardlaw Ramsay of Whitehill; Mr Wilken, Waterside of Forbes; Mr Lockhart, Mains of Airies. *Extraordinary Directors*—Sir Alexander Muir Mackenzie, Bart.; Mr Ballingall, Dundee; Mr Dingwall, Ramornie; Capt. Clayhills Henderson of Invergowrie, R.N.; Mr Whitton of Couston; Sir Robert Menzies of Menzies, Bart.; Mr Murdoch, Garterraig; Mr Howatson of Glenbuck; and Mr Allan, Munnoch. *Chemist*—Dr A. P. Aitken. *Engineer*—Mr James D. Park.

Mr F. N. MENZIES reported apologies for the Earl of Strathmore; Hon. R. Baillie Hamilton; Sir G. Graham Montgomery, Bart.; Sir Wm. S. Walker, K.C.B.; Mr Balfour of Balbirnie; Mr Cook, C.A.; Mr Cran, Kirkton; Mr Dalgleish of Errol Park; Mr Dudgeon, yr. of Cargen; Mr Elliot of Wolfelee; Mr Elliot, Hollybush; Mr Kerr, Broomhouse; Mr Mackenzie, Dalmore; Mr M'Queen of Crofts; Mr Walker, Portlethen.

THE LATE EARL OF GLASGOW.

A letter was read from the Countess of Glasgow, thanking the Directors for the resolution regarding the death of the Earl of Glasgow.

DUNDEE SHOW.

On the motion of Mr BALLINGALL, Dundee, it was arranged that a military band be engaged for the Show. A meeting of the Local Committee held at Dundee on 2d June was reported, when various committees and attending members were appointed.

Local Authority Arrangements.—The regulations by the Directors were adopted as follows: "All owners of cattle entered for the Highland and Agricultural Society's

Show at Dundee, from any district or county in which there has been any case of contagious disease within six months preceding the Show, must make declaration to their district Local Authorities 'that such cattle have not been exposed at any fair, or public mart, within such county, nor have been in any way whatever exposed to contagious disease within a radius of two miles during the three months preceding the Show.' They must obtain a certificate from the clerk to the Local Authority of their district 'that within the last three months there has been no case of contagious disease within a radius of two miles from locality in which such cattle have been kept,' said certificate to be handed to the steward at the showyard cattle gate."

Deputation of Directors.—A large and influential deputation of Directors were named to attend the Show, and also attending members at the various classes of stock.

Working Dairy.—It was remitted to the Committee to carry out the arrangements with the Carse of Gowrie Dairy Company for a working dairy in the yard.

Apianian Exhibition.—It was arranged to accept the offer of Mr Steele of Gaudry, Newport, to carry out an apianian exhibition in the yard.

IMPORTATION OF CATTLE.

Mr GILMOUR gave notice that he would move at the General Meeting that a representation be made to the Board of Agriculture to the effect "that in existing circumstances it would not be safe to admit store cattle from the United States of America into Great Britain and Ireland."

HACKNEY STUD-BOOK.

Volume vii. of the 'Hackney Stud-Book' was presented.

VETERINARY EXAMINATIONS.

General Sir Frederick Fitzwygram's Prizes.—The hall was granted for the examinations, to be held on 10th and 11th June.

MEETING OF DIRECTORS, 18TH JUNE 1889.

Present.—Mr M'Queen of Crofts, *Vice-President*, in the chair. *Ordinary Directors*—Mr Buttar, Corston; Mr Park, Dechmont; Mr Elliot, Hollybush; Mr Glendinning, Hatton Mains; Mr Dudgeon, yr. of Cargen; Mr Mackenzie, Dalmore; Sir James H. Gibson-Craig, Bart.; Mr Marr, Cairnbrogie; Rev. John Gillespie; Mr Macduff of Bonhard; Mr Ballingall, Dunbog; Mr Ford, Fentonbarns; Mr Lumsden of Balmédie, Mr Maxwell, yr. of Munches; Mr Gibb, Boon; Mr Findlay of Easterhill; Mr Gilmour of Montrave; Mr Fisher, Jellyholm; The Hon. The Master of Polwarth. *Extraordinary Directors*—Sir Alexander Muir Mackenzie, Bart.; Mr Ballingall, Dundee; Mr Dalgleish of Errol Park; Mr Dingwall, Ramornie; Captain Clayhills Henderson of Invergowrie; Mr Whitton of Couston; Sir Robert Menzies, Bart.; Mr Kerr, Broomhouse; Mr Elliot, Blackhaugh; Mr Murdoch, Garteraig; Mr Howatson of Glenbuck; Mr Allan, Munnoch. *Chemist*—Dr A. P. Aitken. *Auditor*—Mr William Home Cook, C.A. *Engineer*—Mr J. D. Park.

Mr F. N. MENZIES reported apologies for the absence of Sir Graham Montgomery, Bart.; Mr Lockhart, Mains of Airies; Mr Mackenzie of Portmore; Mr Middleton, Clay of Allan; and Mr Wardlaw Ramsay.

The meeting had under consideration the Local Authority arrangements with reference to the Dundee Show; Report by Committee on estimating Acidity in Milk; General Show, 1891; Abortion in Cattle; Nomination of Judges for the Dundee Show.

MEETING OF DIRECTORS, 5TH NOVEMBER 1890.

Present.—Mr M'Queen of Crofts, *Vice-President*, in the chair. *Ordinary Directors*—Mr Buttar, Corston; Mr Lorne Stewart of Coll; Mr Elliot of Wolfelee; Mr Mackenzie, Dalmore; Sir James H. Gibson-Craig, Bart.; Mr Marr, Cairnbrogie; Rev. John Gillespie, Mouswald; Mr Macduff of Bonhard; Mr Ballingall, Dunbog; Mr Ford, Fentonbarns; Mr Maxwell, yr. of Munches; Mr Shirra Gibb, Boon; Mr Wardlaw Ramsay of Whitehill; Mr Cran, Kirkton. *Extraordinary Directors*—Sir Alex. Muir Mackenzie of Delvine, Bart.; Mr H. Ballingall, Dundee; Mr Dingwall, Ramornie; Captain Clayhills Henderson of Invergowrie, R.N.; Hon. R. Baillie

Hamilton of Langton; Sir Robert Menzies of Menzies, Bart.; Mr Kerr, Broomhouse; Mr Murdoch, Garteraig. *Chemist*—Dr Aitken. *Auditor*—Mr William Home Cook C.A. *Engineer*—Mr J. D. Park.

Mr F. N. MENZIES reported apologies for the absence of the Earl of Strathmore; Sir G. Graham Montgomery, Bart.; Sir James R. Maitland of Barnton, Bart.; Mr Allan, Munnoch; Mr Balfour of Balbirnie; Mr Ogilvy Dalgleish of Errol Park; Mr Elliot, Hollybush; Mr Fisher, Jellyholm; Mr Forbes of Culloden; Mr Gilmour of Montrave; Mr Glendinning, Hatton Mains; Mr Macpherson Grant of Drumduan; Mr Howatson of Glenbuck; Mr Lockhart, Mains of Airies; Mr Mackenzie of Portmore; Mr Middleton, Clay of Allan; Mr Ralston, Glamis; Mr Stirling of Kippendavie; Mr Turner, The Dean; Mr Villiers of Closeburn Hall; Mr Walker, Portlethen; Mr Whitton of Couston; and Mr Wilken, Waterside of Forbes.

THE LATE REV. DR GRANT.

Before proceeding to the business on the programme, the following resolution was unanimously adopted: "The death of the Rev. James Grant, D.C.L., D.D., Chaplain to the Society, having been communicated to the Society, the Directors resolved to record in their minutes the expression of the high respect and estimation in which their Chaplain had been held by them for a period of fifty years, and their sincere regret for the loss of so estimable an officer."

Resolutions recording the regret of the Society for the death of the late Earl of Rosslyn; the late Sir William Baillie of Polkemmet, Bart.; the late Hon. Henry Constable Maxwell Stuart of Traquair; and the late Mr David Milne Home of Milne Graden, were also adopted.

DUNDEE SHOW.

The list of awards was submitted and approved, and the Secretary was instructed to issue the prizes as soon as convenient.

PLEURO-PNEUMONIA.

The SECRETARY reported correspondence with the Board of Agriculture, and submitted a circular which had been sent to all the members of the Society requesting members to support the Board of Agriculture in their endeavours to stamp pleuro-pneumonia out of the country, and the following Committee was appointed to assist the Board of Agriculture, by suggestions or otherwise, in carrying out the Act of Parliament for securing the total suppression of pleuro in Great Britain and Ireland: Sir James Gibson-Craig, Mr Stirling, Rev. John Gillespie, Mr Gordon of Newton, Mr Allan, Mr Mackenzie, Dalmore, Mr Gilmour, and the Master of Polwarth.

ADMISSION OF STORE CATTLE FROM U.S.A.

A letter was read from the Board of Agriculture acknowledging receipt of the Society's minute of 18th June, requesting the Board not to admit store cattle.

GOVERNMENT GRANT.

A correspondence with the Board of Agriculture was reported, and the SECRETARY stated that Dr Fream had called on him and received all the information with reference to the Society's expenditure on agricultural experiments, education, chemical and dairy grants for the last ten years.

DAIRY INSTRUCTION.

A letter was read from the Board of Agriculture requesting the Society to assist the Board in the establishment of a body for the uniform system of examining pupils in dairy work. The following Committee were appointed to draw up a scheme and report as soon as convenient: Mr McQueen, Mr Turner, Mr Allan, Mr R. Wallace, Mr W. J. Maxwell, Mr J. M. Aitken, Mr W. H. Ralston, Rev. J. Gillespie, Mr Andrew Ralston, Mr Cruikshanks, and Mr Wardlaw Ramsay.

GENERAL SHOWS.

It was resolved to add a rule to the Show regulations prohibiting the exhibition of stock in the breeding classes which had been exhibited at any fat stock show. The following poultry classes were added to the list—viz., Plymouth Rocks, Minorcas, Leghorns, and Langshans—and it was arranged to give a "commended" in the discretion of the judges in addition to the two prizes. A committee was appointed to revise the specifications for fitting up the showyard, and to report to next meeting. Members having suggestions for any alteration were requested to communicate them

to the Secretary before the 15th inst. A minor gold medal was awarded to William Simpson, the Society's messenger, for the apparatus invented by him for indicating awards.

PUBLICATIONS.

Readers were appointed to judge the papers lodged in competition for the Society's premiums.

FORESTRY AND HIGHLAND INDUSTRIES.

It was resolved to memorialise the Board of Agriculture to renew the grant of £100 towards the conducting of lectures in Edinburgh by Dr Somerville. It was also resolved to memorialise the Scottish Universities Commission regarding the special advantages of forestry education in Edinburgh University, and the advisability of establishing a Chair of Forestry in the University, and including forestry in the agricultural curriculum. It was also resolved to take the necessary steps to enable holders of the Society's first-class certificates in forestry to be made free life members of the Society, same as agricultural diploma holders.

BURSARIES.

The examinations for the Society's bursaries, which took place on 16th October, were reported, when the following three candidates were awarded bursaries of £20 each: Mr Duncan Munro, 3 Dalrymple Place, Edinburgh; Mr John Campbell, Windsor Park, Musselburgh; and Mr John Brown, Hillhead Farm, Airdrie.

NOMINATION OF DIRECTORS.

A report by the Secretary was read, showing that the following members had been nominated by the Show Districts as Directors: *Glasgow*—Mr D. M'Gibbon, Ardnacraig. *Perth*—Mr W. S. Ferguson, Pictstonhill. *Stirling*—Mr Stirling of Kippendavie. *Edinburgh*—Mr G. Glendinning, Hatton Mains. *Aberdeen*—Mr Alexander M. Gordon of Newton. *Dumfries*—Mr J. M. Aitken, Norwood. *Inverness*—Mr Anderson of Lochdhu. *Border District*—Mr Walter Elliot, Hollybush.

The SECRETARY intimated that a contest had taken place in Dumfries district between Mr Aitken and Mr Yorstoun, and that a protest had been lodged against Mr Aitken's eligibility for the appointment. After discussion, it was remitted to the office-bearers to consider and report.

OFFICE-BEARERS AND DIRECTORS.

Sir James Maitland, Mr Fisher, and Mr Maxwell were added to last year's committee to prepare the list for 1891.

DISTRICT SHOWS AND COTTAGES.

A remit was made to the Committee to revise awards in 1890, and consider applications for 1891.

NOTICE OF MOTION.

Mr BUTTAR, Corston, gave notice of motion for next meeting as to the advisability of making the date of the Society's Show earlier.

BOOKS PRESENTED TO THE SOCIETY.

'A Manual of Injurious Insects and Methods of Prevention,' by Miss E. A. Ormerod, Torrington House, St Albans; and 'Practical Observations on Agricultural Grasses,' by William Wilson, jun., Hillock, Terpersie, Aberdeen, were presented to the Society.

MEETING OF DIRECTORS, 3D DECEMBER 1890.

Present.—*Vice-Presidents*—Mr M'Queen of Crofts, and Mr Middleton, Clay of Allan. *Ordinary Directors*—Mr Buttar, Corston; Mr Elliot, Hollybush; Mr Lorne Stewart of Coll; Mr Elliot of Wolfelee; Mr Buchanan, Garscadden Mains; Sir James H. Gibson-Craig, Bart.; Rev. John Gillespie, Mouswald Manse; Mr Macduff of Bonhard; Mr Ballingall, Dunbog; Mr Ford, Fentonbarns; Mr Lumsden of Balmedie; Mr Maxwell, yr. of Munches; Mr Shirra Gibb, Boon; Mr Gilmour of Montrave; Mr Lockhart, Mains of Airies. *Extraordinary Directors*—Sir Alex. Muir Mackenzie, Bart.; Mr Dingwall, Ramornie; Sir Robert Menzies of Menzies, Bart.; Mr Kerr, Broomhouse; Mr Murdoch, Gartcraig; Mr Howatson of Glenbuck. *Honorary Secretary*—Sir G. Graham Montgomery, Bart.

Auditor—Mr Wm. Home Cook, C.A. *Engineer*—Mr James D. Park. Mr M'Queen in the chair.

Mr F. N. MENZIES reported apologies for the absence of the Hon. R. Baillie Hamilton; Mr Allan, Munnoch; Mr Balfour of Balbirnie; Mr Ballingall, Dundee; Mr Cran, Kirkton; Mr Ogilvy Dalgleish of Errol Park; Mr Dudgeon, yr. of Cargen; Mr Fisher, Jellyholm; Mr Forbes of Culloden; Captain Clayhills Henderson of Invergowie, R.N.; Mr Mackenzie, Dalmore; Mr Park, Dechmont; Mr Wardlaw Ramsay of Whitehill; Mr Stirling of Kippendavie; Mr Whitton of Couston; Mr Walker, Portlethen; and Dr Aitken.

DEATH OF MR CAMPBELL SWINTON OF KIMMERGHAME.

Before proceeding to the business on the programme, the following resolutions were unanimously adopted: "That the Directors desire unanimously to express the deep and sincere regret with which they have received the intimation of the death of Mr Archibald Campbell Swinton of Kimmerghame. That the Directors having, in the minute of the Board Meeting of 1st February 1888, upon Mr Campbell Swinton's resignation of the chairmanship of the Committee on District Shows, recorded their sense of the benefits derived from his assistance during a very long and intimate relation with the Society, not only in connection with the District Shows, but as a Director, a member of the Society's Council on Agricultural Education, and also of the Veterinary and other Committees, it only remains for the Directors to deplore the loss which they and the Society have now sustained by his death. That the Directors request the Secretary to transmit a copy of these resolutions to Mrs Campbell Swinton, with their respectful condolence and sympathy upon the occasion of the painful bereavement which Mrs Swinton and her family have sustained."

Letters were read from the Earl of Rosslyn, Lady Baillie, Mr Maxwell Stewart, and Colonel Milne Home, acknowledging receipt of resolutions of condolence passed at the meeting of Directors on 5th November.

GENERAL MEETING.

The half-yearly General Meeting of the Society was fixed for 21st January, being the usual day for holding the meeting.

OFFICE-BEARERS AND DIRECTORS FOR 1891.

The list was approved of by the Directors, and the names will be published when acceptances have been intimated.

STIRLING SHOW.

Mr BUTTAR, Corston, seconded by Sir ALEXANDER M. MACKENZIE, Bart., moved that the Show be held a fortnight earlier. Sir JAMES GIBSON-CRAIG, Bart., seconded by Mr ELLIOT of Wolfelee, moved the previous question. On a show of hands being taken, twenty-one members voted for the amendment and four for the motion.

It was resolved to hold the Show on 28th, 29th, 30th, and 31st July 1891.

The SECRETARY reported that he had arranged with the Commissioners of Woods and Forests for the use of a portion of the King's Park, subject to conditions which were agreed to. A proof of the premium-list and regulations was submitted and approved.

A contract for the erection of the showyard was entered into with Mr James Farquhar, Broomhill Place, Aberdeen, the present contractor, for four years.

A letter was submitted from Captain Clayhills Henderson of Invergowie, offering £25 as special prizes for yearlings, the produce of the Queen's premium stallions, which was accepted with thanks.

PLEURO-PNEUMONIA.

The Committee appointed to frame regulations for General Shows met, but, in the absence of any regulations having been issued by the Board of Agriculture, they intimated to the Board that they were unable to report.

CHEMICAL AND BOTANICAL DEPARTMENTS.

The proposed grass experiments at Pumpherston were reported and approved; and it was reported that all the analyses of manures and feeding-stuffs analysed by the local analytical associations had been examined, and that only eight cases required further investigation.

DISTRICT COMPETITIONS.

The report by the Committee on District Competitions and Cottages and Gardens was approved, embracing an expenditure of about £300.

AGRICULTURAL EDUCATION.

The examinations for diploma and certificate were fixed for 24th, 25th, and 26th March 1891.

THE GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.

It was resolved to continue the grant of £50 to this College for another year.

ADDITION TO BYE-LAWS.

The proposal to grant free life membership to the holders of the Society's first-class certificate in forestry was intimated to the Board, in terms of the charter.

CURE OF POTATO DISEASE.

A letter was submitted from Mr Allan Buchanan, of Buchanan Brothers, Glasgow, sending a statement of the treatment and cure of potato disease, which had been found most successful in the vine blight in Portugal, which is closely allied to potato blight, and requesting the assistance of the Society in endeavouring to get the process tried next year by potato-growers in Scotland.

MEETING OF DIRECTORS, 7TH JANUARY 1891.

Present.—*Vice-President*—Mr Middleton, Clay of Allan, in the chair. *Ordinary Directors*—Mr Stirling of Kippendavie; Mr Glendinning, Hatton Mains; Mr Lorne Stewart of Coll; Mr Mackenzie, Dalmore; Sir Jas. H. Gibson-Craig, Bart.; Rev. John Gillespie, Mouswald Manse; Mr Macduff of Bonhard; Mr Ford, Fentonbarns; Mr Shirra Gibb, Boon; Mr Fisher, Jellyholm; Mr Wardlaw Ramsay of Whitehill; Mr Lockhart, Mains of Airies; Mr Cran, Kirkton. *Extraordinary Directors*—Sir Robert Menzies of Menzies, Bart.; Mr Walker, Portlethen; Mr Kerr, Broomhouse. *Auditor*—Mr Wm. Home Cook, C.A. *Engineer*—Mr J. D. Park.

Mr F. N. MENZIES reported apologies for the absence of the Hon. R. Baillie-Hamilton; Sir Alex. Muir Mackenzie, Bart.; Mr Ballingall, Dunbog; Mr Ballingall, Dundee; Mr Buttar, Corston; Mr Dingwall, Ramornie; Mr Elliot of Wolfelee; Mr Elliot, Hollybush; Mr Gilmour of Montrave; Mr Howatson of Glenbuck; Mr Jas. Auldjo Jamieson, W.S.; Mr Mackenzie of Portmore; Mr McQueen of Crofts; Mr Maxwell, yr. of Munches; Mr Murdoch, Garterraig; Mr Ralston, Glamis; Mr Whitton of Couston; Mr Wilken, Waterside of Forbes; and Dr Aitken.

THE LATE MR CAMPBELL SWINTON.

A letter was read from Mr J. L. Campbell Swinton, returning thanks to the Directors for kind resolution of condolence passed at last meeting on the death of his father.

OFFICE-BEARERS.

The SECRETARY reported that all the office-bearers had been nominated by the Directors, and that he had published their names in the newspapers in terms of the bye-laws. With reference to the nomination of Mr J. M. Aitken, of the Dumfries district, whose eligibility had been protested against, and concerning which the Board had requested the advice of their law agent, the Secretary read Mr James Auldjo Jamieson's opinion, which was in favour of Mr Aitken, and the Directors therefore sustained his nomination.

MEMBER OF COUNCIL.

Mr Wardlaw Ramsay of Whitehill was nominated a member of Council on Education, in room of Mr Villiers, resigned.

FINANCE.

Abstracts of accounts for 1889-90, and statement of the funds at 30th November last, the close of the financial year, were submitted.

STIRLING SHOW.

The SECRETARY reported correspondence in regard to the ground for the Show, from which it appeared that the Militia has the right of training on the site required, and that the training did not terminate until 11th July, which would be far too late

for the Society to get buildings erected before the date of the Show; but that, through the kindness of the Duke of Montrose, the colonel of the regiment, and the adjutant, Captain Wilson, it had been arranged that the Society shall obtain possession on 22d June. The completed list of Premiums for Highland Industries was submitted and approved.

PUBLICATIONS.

The report of the Committee, of 7th January, containing awards for reports on various subjects, which will be announced at the General Meeting, was approved.

FORESTRY DEPARTMENT.

A minute of Committee, 7th January, was submitted and approved. The minute contained proposals for the establishment of a Chair of Forestry in the University of Edinburgh, and recommended the Directors to print and circulate an appeal to the public with the view of raising subscriptions to create a fund to endow said Chair. It stated that already £1000 had been subscribed by one gentleman; and that £200 had been given by Dr Cleghorn of Stravithy towards the establishment of a Forestry Library for students. The Committee considered that £4000 more would be required, and requested that the Directors would allow the circulars to be sent out in name of the Society. The report was agreed to, and it was remitted back to the Committee to carry out the arrangements.

The proposed addition to Bye-laws Nos. 1 and 2, in regard to holders of first-class certificates in forestry being made free life members of the Society, was submitted in terms of the charter.

POTATO CROP IN IRELAND.

Reports on the failure of the potato crop in Ireland were submitted.

MEETING OF DIRECTORS, 21st JANUARY 1891.

Present.—Mr M'Queen of Crofts, *Vice-President*, in the chair. *Ordinary Directors*—Mr Buttar, Corston; Mr Elliot, Hollybush; Mr Stirling of Kippendavie; Mr Glendinning, Hatton Mains; Sir James H. Gibson-Craig, Bart.; Mr Macduff of Bonhard; Mr Ballingall, Dunbog; Mr Gibb, Boon; Mr Gilmour of Montrave; Mr Fisher, Jellyholm; Mr Lockhart, Mains of Airies; the Hon. The Master of Polwarth. *Extraordinary Directors*—Mr Ballingall, Dundee; Mr Dingwall, Ramornie; Sir Robert Menzies, Bart.; Mr Kerr, Broomhouse; Mr Howatson of Glenbuck. *Honorary Secretary*—Sir G. Graham Montgomery, Bart. *Chemist*—Dr A. P. Aitken. *Auditor*—Mr William Home Cook, C.A. *Engineer*—Mr James D. Park.

Mr F. N. MENZIES reported apologies for the absence of the Earl of Strathmore; the Hon. R. Baillie Hamilton; Sir Alexander M. Mackenzie, Bart.; Mr Balfour of Balbirnie; Mr Elliot of Wolfelee; Mr Forbes of Culloden; Rev. John Gillespie; Captain Clayhills Henderson; Mr James Auldjo Jamieson, W.S.; Mr Mackenzie of Portmore; Mr Middleton, Clay of Allan; Mr Walker, Portlethen; and Mr Whittou of Couston.

The Board had under consideration minute of Argyll Naval Fund Committee, of this date, recommending Colin Duncan Lorne M'Ewan, son of Dr M'Ewan, R.N., to fill the vacancy caused by the promotion of Mr G. P. W. Hope; Minute of Chemical and Botanical Department, 20th January; Grants to Analytical Association; Grant to Dairy Department; Pleuro-Pneumonia Restrictions.

PROCEEDINGS AT GENERAL MEETINGS.

GENERAL MEETING, 18TH JUNE 1890.

Mr JAMES M'QUEEN of Crofts, Vice-President, in the Chair.

NEW MEMBERS.

One hundred and eleven new members were balloted for and admitted.

THE DUNDEE SHOW.

Sir JAMES GIBSON-CRAIG reported that the General Show would this year be held at Dundee on 29th, 30th, and 31st July and 1st August, and he intimated that the following were the entries, as compared with those for the three previous shows and the last show held in Dundee, nearly fifty years ago:—

	Dundee, 1890.	Dundee, 1843.	Melrose, 1889.	Glasgow, 1888.	Perth, 1887.
Cattle . . .	306	317	271	300	...
Horses . . .	232	73	243	308	239
Sheep . . .	397	324	583	517	530
Swine . . .	43	30	56	38	38
Poultry . . .	267	34	220	209	210
Dairy produce . .	92	31	51	110	72
Implements . .	1540	101	1288	1666	1500

The erection of the showyard was being carried out by Mr James Farquhar, Broomhill Place, Aberdeen, who had been the contractor for several years. The Committee recommended that there should be no ball in connection with the Show this year. The yard will remain open till eight o'clock on the nights of Wednesday and Thursday, closing at five o'clock on the other days. There will be a working dairy under the superintendence of the Carse of Gowrie Dairy Company; and Mr Robert Steele, Gauldry, Newport, has undertaken to have an Apiarian Exhibition. Regarding the admission of cattle to the Show, the Directors had resolved to adopt the regulations that were in force at the Shows of 1888 and 1889, that all owners of cattle entered for the Show from any district or county in which there had been any case of contagious disease within six months preceding the Show, must make a declaration to their district Local Authorities, "that such cattle have not been exposed at any fair or public mart within such county, nor have been in any way whatever exposed to contagious disease within a radius of two miles during the three months preceding the Show." They must obtain a certificate from the clerk to the Local Authority of their district, "that within the last three months there has been no case of contagious disease within a radius of two miles from the locality in which such cattle have been kept." With regard to the interpretation of the words, "any fair or public mart," in the declaration, Sir James Gibson-Craig explained that, under the Contagious Diseases Act, the word "mart" included shows. The result of such an interpretation would be to exclude from the Highland Show all cattle exhibited at local and district shows within the last three months, and the Directors did not, therefore, include shows within the meaning of the term "fair or public mart." As to what should be regarded as a period of three months, they had agreed to interpret that as meaning eighty-four days.

Mr GORDON of Newton had a motion on the paper dealing with the Local Authority arrangements for the Show, but after Sir James Gibson-Craig's explanation he withdrew it, and the report was approved.

THE SHOW OF 1891.

Sir JAMES GIBSON-CRAIG reported with regard to next year's Show—which in the ordinary rotation would be held at Stirling—that they were rather in a difficult position. In former years the Commissioners of Supply had made a voluntary assessment towards the Show, but that arrangement had now fallen through since the establishment of County Councils. A Committee was appointed last February to inquire as to the amount of pecuniary support likely to be forthcoming in the district should the Society decide to hold next year's Show at Stirling. One district had intimated a contribution double the amount realised from the voluntary assessment, but in other two districts the subscriptions were practically nil. The result was that only £584 had been promised them from the district, as compared with £779 subscribed when the Society last visited Stirling. Those who knew anything about the finances of the Society must be aware that it was absolutely impossible for them to carry out a great Show, such as that of the Society at Stirling, with such a small guarantee. He thought that in the meantime the best plan would be to defer consideration of the subject of next year's Show until the meeting of members in the showyard at Dundee, when they might be able to present a more favourable report.

This suggestion was agreed to.

ADMISSION OF CATTLE FROM AMERICA.

Mr GILMOUR of Montrave submitted the following motion, of which he had given notice: "That a representation be made to the Board of Agriculture to the effect that, in existing circumstances, it would not be safe to admit store cattle from the United States of America into Great Britain and Ireland." At the outset of his remarks, he criticised the action of a deputation from one district of Scotland, composed of members favourable to the free introduction of American store cattle, who had waited on the Minister of Agriculture the day after he had given notice of his motion. He thought it was a most inopportune time for any such movement to have come from any body of agriculturists, when in February and March no fewer than five cargoes of cattle, in which pleuro was declared to exist, had been landed at Deptford and Liverpool. It was surely most inopportune, when local arrangements had proved ineffectual to cope with the disease, that so much should be done to press the question on the Minister of Agriculture, increasing the difficulties his Department would have to deal with in endeavouring to extirpate the disease. He argued that the length of voyage from America was no safeguard. Ten or twelve days were not sufficient to bring out the seeds of disease in any cargo. It was stated that in many States there was declared to be no disease, and that therefore they might safely be permitted to deal with these States; but he argued that if once the ports of these States were opened, cattle within reach would flock into them, and they would soon have cattle from every part of the United States. He thought the action of the Minister of Agriculture had not been without result in America, and another matter of satisfaction was that it had brought prominently before the people of the country that it was upon the home-breeding of cattle that the country must eventually depend.

Mr BALLINGALL, Dunbog, seconded the motion.

Mr HUTCHINSON, Dundee, moved the direct negative of the motion. He called Mr Gilmour's attention to the fact, he said, that practical farmers had rents to pay, and that they must see that they were properly safeguarded in that respect. He held as a practical tenant-farmer that the cattle trade as conducted in this country was most unfair to the home producer, both breeder and feeder. It practically resolved itself into the free admission of the finished article, with an embargo on the raw material. He could understand Mr Gilmour's position if he had excluded fat cattle as well as store cattle, but to admit fat cattle for slaughter purposes while store stock was excluded pressed unfairly on the home producer. He held that the trade in Irish cattle was much more dangerous than the trade in American store cattle, and Professor Williams had written him to say that he had never seen contagious pleuro in States cattle. There might be such a thing, but let them take steps to show that it was really the case. Personally he held that the cattle trade of this country could not be conducted without some risk of disease. As long as they handled stock there would be some risk of disease more or less, and this country required such an amount of stock that we must try and conduct the traffic with a limited amount of risk.

Mr OGILVY DALGLEISH of Errol Park, Perth, seconded the amendment, and Mr COWE, Balhousie, supported. The meeting, Mr Cowe said, had been asked to give out no indefinite sound in the matter; but he denied that the meeting represented

the full voice of the Society. If they were to have that they must meet face to face at Dundee, when the practical farmers would be heard.

The Rev. JOHN GILLESPIE, Mouswald, contended that in the south of Scotland the almost unanimous feeling of cattle owners was against the movement that had been supported in Forfarshire. He argued that the case of Ireland illustrated the extreme danger of importing cattle from America. The disease in Ireland existed in the area around Dublin, and yet cattle coming from other parts of Ireland and passing through that area had been the means of introducing the disease into this country. His observation in America was that cattle from the western States could not be safely brought through the eastern States so long as there was any disease in these parts.

Mr GORDON of Newton said that at a meeting of the Local Authority of Aberdeen there was not a dissentient voice when it was proposed to petition the Minister of Agriculture against the introduction of United States cattle.

Mr SMITH, Carse of Gowrie Creamery, expressed the opinion that pleuro was brought to this country by Canadian cattle in larger proportion than by either United States or Irish cattle.

Professor WILLIAMS, Edinburgh, as an inspector of large experience, said it was very seldom that pleuro-pneumonia was brought to this country by Canadian cattle.

Mr MARR, Cairnbrogie, in supporting Mr Gilmour's motion, said the main reason why the breeding of cattle in this country had reached such a low ebb was the fear which farmers had of their stocks being slaughtered for pleuro-pneumonia.

Mr GILMOUR, in replying on the discussion, maintained that the introduction of disease into this country affected the landlords as well as the tenants. As one of the former, he had no dread for the future of agriculture. They had been willing in the past to share the difficulties of their tenants, and they would go on doing so. It was, however, a most inopportune time to endeavour to influence the Board of Agriculture, which had been appointed largely for the purpose of dealing with disease in this country, in any way to introduce States cattle in their midst.

On a vote being taken, Mr Gilmour's motion was carried by thirty-six to nineteen for the amendment.

GRATUITY TO THE SENIOR CLERK.

The Board of Directors recommended that a sum of 100 guineas be voted to Mr Duncan, the senior clerk, in recognition of his long and faithful services to the Society.

Sir ROBERT MENZIES, in moving the approval of the recommendation, said Mr Duncan was now in the fiftieth year of service with the Society, and all the members knew how thoroughly and courteously he had discharged the duties of the office.

Mr COWE, in seconding the motion, said he thought the Directors had been economical enough in this matter. If they had recommended 200 guineas he did not think it would have been a penny too much.

The motion was unanimously agreed to.

CHEMICAL DEPARTMENT.

Dr AITKEN said: During the past winter a number of useful investigations have been carried on by agricultural societies in various parts of the country under the auspices of the Society. Chief among these were feeding experiments with various objects in view, which I need not particularise here, as a full report of them is contained in the last volume of the 'Transactions,' which is now in the hands of the members. Since the publication of that report other three experiments have been completed, the analytical details of which are still in progress. The objects aimed at in these are to determine the relative advantages of cake and corn as supplementary fodders in the dietary of wintering and of fattening cattle, and the relative economy of linseed-cake and cotton-cake. There are also experiments to determine the digestibility of turnips and ensilage, the full details of which will not be in our possession for some time. Some interesting questions arising out of these experiments have been discussed in the reports already published, and I need not occupy your time with reference to them. I would only say here that the work has been done by those in charge of the experiments in a most thorough and careful manner, and that it has not only created a great amount of interest in the districts where it was carried on, but it has been the means of affording much useful information, and giving rise to interesting discussion and interchange of opinions. I have visited the districts where the experiments have been made, and have discussed the various points that have been raised by them with the committees under whose care they were carried out, and in some instances have taken part in public discussions regarding them; and I am more than ever convinced that in fostering such local investigations the Society is doing a most useful work, and disseminating knowledge of immediate practical value amongst

a large class of the farming community who can be appealed to in that manner more successfully than in any other.

I would take this opportunity of referring again to one subject which has been very strongly impressed upon my mind in the conduct of these investigations, and that is the great value of the weigh-bridge to all who are engaged in cattle-feeding. My experience, short as it is, has convinced me that that instrument must no longer be regarded as a luxury to be indulged in by a few, but that it must become an essential of all farms where cattle are being reared and fed. I am quite aware that the practised eye of a feeder can gauge the progress of his stock with extraordinary accuracy; but I am quite sure that even the most expert judge will find the use of the weigh-bridge a valuable aid and guide in his operations, and that it will invest his industry with enhanced interest and precision.

Besides the feeding experiments referred to, there are manurial investigations going on in six counties under the charge of local societies, in which a very large number of farmers are engaged.

The reports published of last year's experiments show how reliable are the results obtained when a large number of farmers in widely different parts of the country are simultaneously engaged in working out the same problems. It has been the misfortune of most of the manurial experiments made in the past, that they were either so few in number, or so localised that it was difficult to distinguish results of local from those of universal application. The large number and wide distribution of those who are now working under the Society's scheme enables that distinction to be easily drawn, and it is hard to see how that can be attained except through the agency of a large national Society. The money which the Society set apart for the encouragement of local investigations last year was entirely expended, and the Directors were reluctantly compelled to withhold their aid from some associations which they would have gladly assisted. In view of the increasing number of those who are working under the Society's scheme, I am of opinion that it is worthy of the consideration of the Society whether it should not apply for a share of the annual grant given by Government for the advancement of agricultural education, because the work which is being done under the Society's auspices is precisely of the kind that the Government grant is intended to encourage.

At the Society's Experimental Station at Pumpherston an investigation is now to be begun which has been in preparation for some time on a part of the station—viz., a somewhat extensive series of experiments on the subject of grass seeds and the making of pasture. I cannot here enter into the details of the experiments, but would only explain briefly that they are intended to show the character of all the grasses of any importance to agriculture, the conditions of their growth, the areas which they require for their successful cultivation, their mutual interdependence, and the position they ought to occupy in the formation of pasture or meadow. These experiments will be under the charge of the combined Chemical and Botanical Committee, for they have for their object the investigation of problems in which chemistry and botany are closely interwoven.

BOTANICAL DEPARTMENT.

Professor M'ALPINE said: I have the honour to report that during the past season I have examined close upon 400 samples of grass and clover seeds. In purchasing seeds, it is advisable that the farmer should require from the seedsman a guarantee of the percentage of the germinating power of the seed. This percentage is estimated in two ways: (1) the seeds to be tested are *selected* from the sample, and the light seeds rejected as impurity; (2) the seeds are taken as they come in the sample, whether light or heavy. The former plan is followed on the Continent, the latter in this country. Whichever method is adopted, the farmer cannot err in determining the true value of the seed purchased if *purity* as well as germination is guaranteed. The rule for determining the real value is—Multiply purity by germination, and divide by 100. Two varieties of tall fescue are now sold by seedsmen: (1) tall fescue (*Festuca elatior*); (2) New Zealand tall fescue (*Festuca arundinacea*). The latter is a reed-like fescue: its seed is much cheaper than that of the former, and the germination better; but the plant itself is very much coarser, and much less valuable to the farmer than ordinary tall fescue. Two remarkable samples of meadow fescue were analysed, and I mention the result to show how age diminishes germinating power. The percentages of germination obtained were, in the one case 22, in the other 30. A curious mistake or case of substitution also came under my notice. The sample in question was labelled cocksfoot, but on examination turned out to be hard fescue, pure and simple. In fairness to all parties, it seems advisable that the samples of seed selected for analysis should be more carefully selected than has sometimes been the case. The following table shows the germinating power of the seed samples analysed during the present season:—

	Percentage of germination.	
	Minimum.	Maximum.
Red clover	90	99
Cow grass	92	99
White clover	83	95
Alsike	82	98
Trefoil	95	98
Tall fescue	80	94
Meadow fescue	93	99
Hard fescue	90	96
Cocksfoot	80	96
Timothy	93	99
Foxtail	65	78
Crested dogstail	90	94
Italian ryegrass	82	98
Perennial ryegrass	85	98
Smooth-stalked meadow-grass	24	56
Rough-stalked meadow-grass	24	70
Wood meadow-grass	30	63

The members of the Society are now much more on the alert about grasses and grass seeds than hitherto, as evidenced by the great number of queries that have been sent regarding the nature and amounts of seeds to be sown under given circumstances, and also as to the identification of grass plants.

The report was adopted.

AGRICULTURAL EDUCATION.

The Rev. JOHN GILLESPIE reported the following results of the Society's examination in Agriculture, fourteen candidates being presented:—

For Diploma—Henry Crabtree (Lancashire), 30 Lutton Place, Edinburgh; John J. Jeffrey, Blackaddie, Sanquhar; James Kerr, Mid Kelson, Castle-Douglas; Ash Rudd, East Ruston Hall, Stalham, Norwich; Harold Sessions, Russell House, Gloucester. *For first-class certificate*—George Cruickshank, Comisty, Huntly; Wilfrid James Fleet (St Petersburg), Marchmont, Duns; George Pearse Foaden, Sparnham House, Ashburton; James Weir, Woodilee Farm, Lenzie.

Mr GILLESPIE also announced that the prizes given in books to the class of agriculture in the University of Edinburgh had this year been awarded as follows:—E. A. Foulton, Sedgwick, Kendal; J. S. Gordon, Stragollan, Strabane, Ireland; R. J. Irving, Blackhall House, Carlisle; H. Wend Joyce, Blackfordly, Burton-on-Trent; A. B. Stevens, Mains of Kilgraston, Bridge of Earn.

FORESTRY DEPARTMENT.

Sir ROBERT MENZIES reported that the Society's first-class certificate in forestry had been awarded to Alexander John Farquharson, Estate Office, Blair-Drummond.

RAILWAY RATES INQUIRY.

The Rev. JOHN GILLESPIE stated the steps which had been taken by the Committee of the Society in laying evidence before the Railway Rates Commission. He had reason to believe that in a short time the Commissioners would present their report in the form of a provisional order, which would be laid on the table of the Houses of Parliament.

AGRICULTURAL GRANTS.

On the motion of Colonel DUDGEON, yr. of Cargen, seconded by Mr GILLESPIE, it was resolved that in view of the large and increasing amount of money which was expended annually on investigations in various departments of agricultural research, formal application should be made to the Board of Agriculture for a share of the annual grant made by Government for inquiry into the subject of abortion in cattle.

ACID TESTS FOR MILK.

The Committee appointed to examine the competitive appliances for the Society's prize of £100 offered for the best instrument for testing acidity in milk, reported that after examination they were of opinion that no award should be made, as none of the appliances came up to requirements, or was superior to the tests now in use.

GENERAL MEETING IN THE SHOWYARD AT DUNDEE,
30TH JULY 1890.

The usual General Meeting of the Society was held in the pavilion on the ground in the course of the day. There was a large attendance of members, and the chair was occupied by Mr M'Queen of Crofts, in the absence of the Earl of Strathmore, the President.

VOTES OF THANKS.

Mr FORBES of Culloden moved a vote of thanks to the Commissioners of Supply for the counties of Forfar, Fife, and Perth, for their support to the auxiliary fund of the Show, and for their willing and active co-operation in promoting the success of the meeting.

Mr ELLIOT of Wolfelee, who seconded the motion, remarked that this was the last occasion on which they would have an opportunity of thanking the Commissioners of Supply. He trusted that in future they should be able to thank the County Councils for the same liberal support to the Society as the Commissioners of Supply had always given it. The Commissioners of Supply for that district had come forward strongly, and had helped the Society materially, and he hoped that when the Show of the Society came back to that district eight years hence, the County Councils would do as much as the Commissioners of Supply had.

The vote of thanks was heartily accorded.

The MASTER of POLWARTH proposed a vote of thanks on behalf of the Society to the Lord Provost, Magistrates, and Town Council of Dundee. It was owing, he said, to their exertions that the Society had visited that city, so important and so famous in commercial and business circles, and though, no doubt owing to the very fact of the extent of the city, the Corporation had had some difficulty to contend with in the way of securing a site for the Show, he did not doubt that the promises made and the expectations held out by the Lord Provost and Magistrates would be amply fulfilled at the conclusion of the Show.

Mr FISHER, Jellyholm, seconded the motion, which was unanimously and cordially adopted.

Mr HUGH BALLINGALL, Dundee, who acknowledged the vote in the absence of the Lord Provost and Magistrates, said they had looked forward to the visit of the Society with very great pleasure indeed. As the Master of Polwarth had said, they had experienced great difficulty in getting a suitable piece of ground for the Show which would be large enough and at the same time central enough. He regretted exceedingly that they had not a better site to give the Society, but if it favoured Dundee with a visit some eight or nine years hence, by that time the Corporation, who were at present reclaiming land to the west of the city, would be able to offer as a site a piece of reclaimed land from the river, covered with beautiful grass. The Corporation hoped that the success of the Society's Show at Dundee would be great, as he had no doubt it would, should the weather continue favourable.

The CHAIRMAN moved a vote of thanks to the Dundee Harbour Trustees for the use of the ground upon which the Show is held. They were, he said, indebted to the Trust for the use of the ground. Although it was scarcely so good as they had anticipated, it was not the fault of the Harbour Trustees, who had given the Society the best they had.

The vote of thanks, seconded by Mr BUTTAR, Corsfón, having been accorded,

Mr JAMES BERRY, Dundee, a member of the Harbour Trust, acknowledged the vote, and said he could assure the meeting that the Trust had been at very considerable trouble in putting the ground in order for the Show. They had done their best to make it suitable, and they hoped before the end of the Show the ground would be made thoroughly satisfactory to the Society.

The CHAIRMAN proposed a vote of thanks to the District Committee and Mr Gilmour of Montrave, the Convener, for carrying out the arrangements in connection with the Show.

The Rev. JOHN GILLESPIE, Mouswald, seconded the motion. Speaking from a considerable experience of former Shows, he thought nowhere had the Society been more fortunate in getting a good local committee than on that occasion.

Mr GILMOUR of Montrave briefly acknowledged the vote of thanks.

THE NON-EXHIBITION OF ENTERED STOCK.

Mr ROBERT DICKIE, Killeonan, Campbeltown, moved, in terms of notice, that the following regulation relating to fines for non-exhibition of animals at the Society's Show should be rescinded—viz., "In order to lessen the number of vacant stalls, the following fines will be imposed on all exhibitors whose animals are not forward: for

horses, 40s. ; cattle, 20s. ; sheep and swine, 10s. ; poultry, 5s.,—this fine to be in addition to entry-money. In the case of death or illness of an animal, a veterinary surgeon's certificate is necessary for a remit of the fine." In support of his motion, Mr Dickie said he found in looking over the Transactions of the Society that this part of the regulations had only recently been put in force, and to his mind it would have been better had it not been put in force at all, for an exhibitor who paid his stall-rent and afterwards found himself unable to forward his stock from some unforeseen cause, was sufficiently penalised. Such cases frequently arose from the fact that nearly two months intervened between the date at which entries closed and the holding of the Show, and it was hard upon exhibitors to fine them in these circumstances, for they would agree with him that no exhibitor entered his stock not intending to forward them. He therefore thought it had been overlooked, when the rule in question was added to the regulations, that it cut in a different way from that which had been intended, and in a way very much more detrimental to the interests of the Society than a few empty stalls at their annual Shows were—by discouraging exhibitors from entering stock, and consequently, by reducing the competition. He brought forward the motion not in any selfish spirit, for he had not been an exhibitor at the Society's Shows for the last twenty years, but because he well knew the trouble and expense entailed in forwarding stock from a distance to the Show, and held the opinion that exhibitors required all the encouragement that could be given them, instead of being handicapped by a system of fines for the results of circumstances over which they had no earthly control.

Mr JOHNSTONE, Lochburnie, seconded Mr Dickie's motion.

Mr GILMOUR of Montrave moved, as an amendment, that the system of fines for the non-exhibition of entered stock be adhered to, and that it be remitted to the Directors with powers to consider the possibility of shortening the time for receiving entries for the Show. Speaking in support of his amendment, Mr Gilmour said they knew that fines were very unpopular, and that in many cases imprisonment was preferred to them. He did not for a moment propose that they should revert to any such principle as that ; but he would remind them that the existing system of fining had only been resorted to in the interests of the Society's Annual Show. It had been found in past years that the number of vacant stalls made the Show anything but the display which the members would have wished it to be ; and while considering in every way the interests of exhibitors, they had to consider the rights also of the visitors to the Show, especially when they had found—as they did one year—that the percentage of animals absent was as high as 40 and 45. When they saw, also, that at the present Show, in the horse section, there were no fewer than thirty empty stalls, it was only common-sense to suppose that there would have been a great many more had no penalty attached to the non-exhibition of entered stock. He pointed out that the system of imposing fines of this kind was not confined to the Highland and Agricultural Society, and went on to show that there were practical difficulties in the way of shortening, to any great extent, the period between the close of entries and the Show, remarking that Mr Dickie had erred slightly as to the time this year. Not two months, but six weeks and two days had elapsed between the closing of the entries and the Show. It might be possible, he added—although there were practical difficulties in the way—to shorten that time, and this the Directors would no doubt be glad to consider.

Mr FYSHE, Treaton, seconded the amendment. He pointed out that in cases of illness all that was necessary was for owners to produce a veterinary surgeon's certificate, which would relieve them.

Mr WILSON, Manwraes, Kilbarchan, supported the motion. In view of these fines, he remarked, it came to be a question with exhibitors what entries they should make. He asked if all the fines which had been imposed had been collected.

The CHAIRMAN stated in reply that the Secretary informed him that all the fines, with one exception, had been collected.

Mr WILSON said he could mention more than one. Continuing, he said that besides the fines, before exhibitors could satisfy the Society and get themselves freed from the fines, they had to pay for a veterinary surgeon's certificate, which was so much more. If they paid their entry-money they paid for their stall-rent, and while it was all very well to say that they must satisfy the public, yet it must be remembered that if they had no exhibitors they would have no public. The interval between the closing of the entry list and the Show was such that exhibitors of Ayrshires had no conception whether they would be able to send forward their stock. He considered it would be in the interests of the Society to abolish the fines.

Mr RODGER, Warrington, said the Directors would be able to tell whether the entries had fallen off, or if the number of vacancies was greater than before the fines were imposed. The rule operated more severely at this Society's Show than at other exhibitions. The Royal Agricultural Society of England had a rule that the animal must belong to the exhibitor at the time of the Show. This Society, he understood,

existed for the purpose of encouraging the breeding of animals, and the making of money by breeding, and they ought not to stand in the way of that being done. If an animal was sold, and was taken out of the country, the fine had to be paid all the same. He suggested that the rule might be amended to provide that animals must be *bona fide* the property of the exhibitors at the time of the Show. Such a rule would remove a certain amount of hardship.

The Rev. JOHN GILLESPIE, Mouswald, Dumfries, said that the important matter raised by Mr Rodger was very carefully considered by the Board of Directors in drawing up this regulation. He (Mr Gillespie) was one of those who had some sympathy with the view now put forward by Mr Rodger, that men who sold an animal in the interval between the date of entry and the Show should not be fined; but after hearing the matter discussed he changed his opinion. If a man sold an animal he was to be congratulated, and he was in a better position to pay the fine. A good deal could be said on both sides, but he considered that the present rule should be maintained. He had the honour of being steward of horses at Dumfries, and he had the painful duty to report that he found 45 per cent of the horse stalls empty. It was a melancholy sight to see people going past perhaps a dozen stalls and not finding an animal: it was almost suggestive of a desert. The interval between the closing of the entry list and the Show was only six weeks and two days. A comparatively few years ago the interval was more than two months, and the Board took into consideration various representations which were made as to the length of time, and they succeeded in shortening it by three weeks. The Board was prepared to consider the matter again, and if found practicable they would make the last day for receiving entries as near the date of the Show as possible. The members must, however, bear in mind that the showyard had to be erected. In this uncertain climate they had the elements to contend with; and altogether there were serious practical difficulties in the way of reducing the interval to a very low limit.

A vote was then taken, and the CHAIRMAN said the amendment was carried by a large majority.

PLEURO-PNEUMONIA.

The next business on the agenda was the consideration of a motion with regard to pleuro-pneumonia, of which notice had been given as follows by Mr Alexander M. Gordon of Newton, Aberdeenshire: "All owners of cattle entered for the Highland and Agricultural Society's Show at _____, from any district or county in which there has been any case of contagious disease within six months preceding the date of the Show, must make declaration before a Justice of the Peace,—1. That such cattle have not been exposed at any fair or public mart within such county or district. 2. Where pleuro-pneumonia has existed in any district or county within the said period of six months, the declaration to be made must state, in addition to the foregoing statement, that the cattle have not within the said period been within the precincts of a pleuro-pneumonia place, circle, or area. 3. Forms of the required declarations will be furnished on application to the Secretary."

The CHAIRMAN said that before calling on Mr Gordon to move his resolution he had to make the following statement: "That the Board of Directors unanimously agreed at a meeting that morning, in view of the understanding that the Board of Agriculture would issue certain regulations in September, and that the Society had till next year to deal with the rule complained of, to consider the question carefully, and come to a resolution on the subject not later than the Board's meeting in December, and that an opportunity will be given to discuss the matter at the annual meeting of the Society in January."

The SECRETARY (Mr F. N. Menzies) also read the following communication from the Board of Agriculture, addressed to the Earl of Strathmore, President of the Society:—

"BOARD OF AGRICULTURE,
3 ST JAMES'S SQUARE, LONDON, S.W.,
24th July 1890.

"MY LORD,—I am directed by the President of the Board of Agriculture to transmit a copy of the Act of Parliament, 53 and 54 Vict. c. 14, which received the Royal Assent on the 4th inst., which he begs you will have the kindness to lay before your Society.

"The Act, which comes into force on September 1, 1890, confers on the Board further powers for dealing with pleuro-pneumonia, and provides for the slaughter of animals by the Board, and for the payment of compensation out of Imperial funds.

"The President feels that for the success of the object which the Board have in view—namely, the extinction of pleuro-pneumonia—the cordial support and co-operation of owners and breeders of stock, and of all connected with the cattle trade, is essential.

"Pleuro-pneumonia could be without difficulty arrested when its existence is dis-

covered ; but it is perhaps of all contagious diseases the most easy of concealment, and it is to be feared that in too many cases prompt information of the existence of the disease, which alone can enable the Board to deal successfully with it, has been withheld.

"The President believes that the Highland and Agricultural Society, with its high position, and comprising, as it does, so many of the leading and most influential agriculturists of the country, can lend the Board most valuable support in the task they have undertaken, and I am directed to say that he will feel greatly indebted to the Society for any co-operation or assistance which they may be able to afford to the Board of Agriculture in carrying out the provisions of the Act.—I am, my Lord, your Lordship's obedient servant, C. HARRY TENNANT, for Secretary.

"The EARL OF STRATHMORE and KINGHORN,
President, Highland and Agricultural Society of Scotland, Edinburgh."

Mr GORDON thanked the Board of Directors for the very cordial and kind spirit in which they had met his resolution. He accepted their suggestion as a compromise. The matter accordingly dropped.

THE SHOW OF 1891.

In the absence of Colonel Stirling of Kippendavie, the Convener of the Shows Committee, the SECRETARY (Mr F. N. Menzies) submitted the report of that committee with regard to next year's Show at Stirling. They would all be aware, he said, that on account of the Commissioners of Supply being superseded by the County Councils the Society had been obliged to alter its arrangements, and they were now raising a subscription in the Stirling district and throughout the neighbouring counties in order to ascertain whether they could obtain funds enough for the auxiliary fund to enable them to hold the Show at Stirling next year. For that purpose a district committee had been appointed, and their efforts had been fairly successful, sums having either been already received or promised amounting in all to only £92 less than the fund raised in 1881. The west district of Perthshire had done very well indeed, having doubled its subscription, but he would not say what the other districts had done, as it would be invidious. It lay with the meeting to say whether in these circumstances the Show was to be held at Stirling in 1891.

The CHAIRMAN said he thought they might take it that with the promises which had already been made a fund equal to that of 1881 would be raised in the Stirling district.

It was then agreed that next year's Show should be held at Stirling.

The proceedings terminated with a vote of thanks to Mr M'Queen for presiding.

ANNIVERSARY GENERAL MEETING, 21st JANUARY 1891.

Mr M'QUEEN of Crofts, Vice-President, occupied the chair, in the absence of the President, the Earl of Strathmore, who was prevented by indisposition from being present.

NEW MEMBERS.

Sixty-eight new members were balloted for and duly admitted.

ELECTION OF OFFICE-BEARERS.

The following were elected office-bearers for the year: *President*—The Duke of Montrose. *Vice-Presidents*—Lord Balfour of Burleigh ; William Forbes of Calender ; the Hon. R. Baillie Hamilton ; C. Macpherson Grant of Drumduan. *Ordinary Directors*—Patrick Stirling of Kippendavie ; Robert Anderson of Lochdhu ; G. R. Glendinning, Hutton Mains ; Alexander M. Gordon of Newton ; W. S. Ferguson, Pictstonhill ; David M'Gibbon, Ardnacraig ; Walter Elliot, Hollybush ; John M. Aitken, Norwood. *Extraordinary Directors*—R. Yellowlees, Provost of Stirling ; Sir Charles E. F. Stirling, Bart. ; Colonel Murray of Polmaise ; Colonel Drummond Moray, yr. of Blair-Drummond ; Archibald Stirling of Keir ; Colonel Williamson of Lawers ; John M. Martin of Auchendennan ; A. Campbell Douglas of Mains ; Andrew Mitchell, Alloa ; John Craig, Innergeldie ; Sir Allan R. Mackenzie, Bart. ; James M'Queen of Crofts ; Captain Clayhills Henderson of Invergowie ; David Buttar, Corston ; Sir Robert Menzies, Bart. ; George J. Walker, Portlethen ; John Kerr, Broomhouse ; Thomas Elliot, Blackhaugh ; Alexander Murdoch, Gartcraig ; Charles Howatson of Glenbuck. *Chaplain*—Rev. Archibald Scott, D.D., St George's, Edinburgh.

THE LATE CHAPLAIN.

On the motion of Sir GRAHAM MONTGOMERY, it was agreed to record in the minutes an expression of regret at the death of the late Dr Grant, Chaplain of the Society.

VOTE OF THANKS TO LORD STRATHMORE.

The following resolution was unanimously adopted: "That the Right Hon. the Earl of Strathmore having presided over the Highland and Agricultural Society of Scotland during the past year, the thanks of the Society are eminently due to his lordship for the zeal exhibited by him in promoting its efficiency and prosperity, for presiding at the public banquet held at Dundee on the occasion of the General Show there, and for the great interest he has always taken in the Society."

FINANCIAL STATEMENT.

Sir JAMES GIBSON-CRAIG submitted the accounts of the Society, which showed that the general funds amounted to £66,054, in addition to the building fund of £3553. The income for the year was £6243, 13s. 6d., and the expenditure £5805, 4s. 11d., leaving a balance at credit of the Society for the year of £410, 8s. 7d. The accounts for the Dundee Show held last summer showed a balance to the good of £162, 7s. 3d. The Argyll Naval Fund amounts to £6514, 13s. 6d., after paying five annuitants £40 each.

DUNDEE SHOW, 1890.

Mr STIRLING of Kippendavie, Convener of the Committee on General Shows, said: On the part of the Directors I have great pleasure in being 'able to report the very satisfactory result of the Show held at Dundee in July last. At the four previous Shows, held at Melrose, Glasgow, Perth, and Dumfries, there were losses varying in amount from £4 at Perth in consequence of cattle being prohibited, to £1081 at Glasgow owing to the greater attraction of the International Exhibition, or a total loss of £2490 on the four places; but on the present occasion, there is an estimated surplus of £162, as will be observed from the accounts which have just been submitted. The reports on the Dundee Show, which have already been published, so exhaust all matters of detail, that it only remains for me to say that the results have been financially successful.

Mr BALLINGALL, Dundee, expressed the hope that, looking to the success of the Dundee Show, the Society would keep the fact in mind, and give the city another turn in the rotation of the Shows.

The CHAIRMAN said he had no doubt that, when the time came again for holding the Show in the Dundee district, the Directors would give it their favourable consideration.

Mr GILMOUR of Montrave said he thought it very necessary that those interested in the Dundee Show would specially bear in mind the requirements of the Society, and endeavour to place at the disposal of the Society a very much better show-ground than they did on the last occasion.

Mr BALLINGALL replied that they had given the best ground at their disposal. He hoped that eight years hence, however, they would be able to offer a much better.

STIRLING SHOW, 1891.

Mr STIRLING then reported that in accordance with the resolution of the General Meeting of members, held at Dundee in July last, to hold the General Show for 1891 at Stirling, all the preliminary arrangements are progressing satisfactorily. The premium list has been arranged, and includes £743 for cattle, £474 for horses, £572 for sheep, £69 for swine, £114 for poultry, £54 for dairy produce, £51 for Highland industries and fisheries, £104, 4s. for silver medals to breeders and for extra stock, making a total of £1983, 4s.: besides £24 given by Mr Macpherson-Grant of Drumduan, for three-year-old cows of the Aberdeen-Angus breed; £25 given by Captain Clayhills Henderson of Invergowrie, for yearlings, the produce of the Queen's premium stallions that have served in Scotland, out of mares of any breed; and the Tweeddale gold medal, of the value of £20, for the best shorthorn bull in the yard. In connection with the premium list, I may be permitted to remind exhibitors that an animal which has gained a first premium at a general Show of the Society cannot again compete in the same section, but may be exhibited as extra stock; and that no cattle or sheep which have been exhibited as fat stock at any Show are eligible to compete in the breeding sections for the Society's prizes. The period fixed for the Show is from the 28th to the 31st July next, both days inclusive. The last days of entry are—Implements and other articles, Monday, 25th May; stock, poultry, and dairy produce, Monday, 22d June. No entry taken later than by first post on Monday morning (22d June). Post entries for stock only taken at double fees till Wednesday morning (24th June), at ten o'clock. Covered booths for offices, Monday (22d June).

The Society's application to the Woods and Forests Department for permission to hold the Show on the King's Park was granted, as on former occasions. In reference thereto, I may add that the Stirlingshire Militia have the right of training on part of the ground selected for the Show, and that the training does not terminate until 11th July, which would have been too late for the Society to get the necessary buildings erected before the date of the Show; but, through the kindness of the Duke of Montrose, the colonel of the regiment, it has been arranged that the Society is to get possession of the ground on the 22d of June. The contract for enclosing and fitting up the Society's showyards, entered into in 1888 with Mr James Farquhar, Broomhill Place, Aberdeen, having expired, a new one was lately entered into again with Mr Farquhar for four years. In regard to the auxiliary subscription in aid of the Show, members are aware that in former years the Commissioners of Supply made a voluntary assessment, but that arrangement has now ceased since the establishment of County Councils. A Committee was appointed in February last to inquire as to the pecuniary support likely to be got. In consequence of the small amount reported (except in one district, West Perthshire) at the General Meeting held here in June last, it was thought desirable to defer consideration of the subject till the meeting of members in the showyard at Dundee. An increased subscription having been reported, that meeting agreed that the Show of 1891 should be held at Stirling, as it was thought that, from the promises which had then been made, a sum at least equal to that of 1881 would be raised in the Stirling district for 1891. The counties embraced in the district of the Show have been divided into six districts, for the purpose of collecting subscriptions, with conveners, as follows, and it is confidently expected that the Committees will continue their exertions: 1. *East Stirlingshire*—William Forbes, Esq. of Callendar, Falkirk. 2. *West Stirlingshire*—James Murray, Esq., Catter House, Drymen. 3. *Central Stirlingshire*—Sir James R. Maitland, Bart., Craigend, Stirling. 4. *West Perthshire*—Patrick Stirling, Esq. of Kippen-davie, Dunblane. 5. *Clackmannan*—The Earl of Mar and Kellie, Alloa Park, Alloa. 6. *Dumbartonshire*—J. M. Martin, Esq. of Auchendennan, Alexandria, N.B.

AGRICULTURAL EDUCATION.

Mr WARDLAW RAMSAY of Whitehill reported that the third examination of candidates for bursaries under the new bye-law took place simultaneously at Edinburgh and Glasgow on the 16th October, when five gentlemen presented themselves. The following were found entitled to bursaries of £20 each: Duncan Munro, 3 Dalrymple Place, Edinburgh; John Campbell, Windsor Park, Musselburgh; and John Brown, Hillhead Farm, Airdrie. Mr Ramsay further reported that the examination of candidates for the Society's agricultural certificate and diploma, and for the certificates in forestry, had been fixed to be held on the 24th, 25th, and 26th March, candidates being required to lodge intimation before the 16th of March.

CHEMICAL DEPARTMENT.

Dr AITKEN said: During the past year field experiments have been carried out in ten different counties of Scotland. Except in one or two instances these have been under the superintendence of local committees, who took care that every detail, from the selection of the ground to the weighing of the crop, should be carried out in such a manner as to secure accuracy, and in some instances visits were made by committees during the growing season, and notes taken of the progress of the experiments. Four of the experiments drawn up by the Chemical Committee have been under trial, but the one which has been most generally tried is No. 8, whose object is to find out what is at once the most efficient and least expensive turnip manure. Former experiments had shown that the dearer manures were not the most effective, but that in very many instances the cheapest manures produced the best results, and that a great deal of money was being spent on manures which might easily be saved if farmers would only be at the trouble to try one or two of the simple experiments suggested by the Chemical Committee and be guided by the results.

The cost of the manures in this experiment varies from 12s. to 20s. per acre, and the requisite quantities were supplied gratis by the Society to all Associations who undertook to use them in accordance with the instructions of the Chemical Committee. The reports from these Associations are now coming in, and I expect to be able to report the results of about a hundred different trials in the forthcoming volume of the 'Transactions.'

An interesting investigation has been going on for some months at Mr Milne's farm, Mains of Laithers, to determine the feeding qualities of the turnips and oat-straw grown there, and to supply information regarding the manurial value of these and other kinds of fodder. For this purpose a special stall has been constructed in which an ox is being fed in various ways, and an accurate account is being kept of the fodder and its products, both as regards quantity and quality.

Preparation has also been made for carrying out an important experiment in Ayrshire to test the milk-producing qualities of the Ayrshire cow, and the quality of the milk produced under various systems of feeding and management in use in that district. The experiment will be under the superintendence of the Ayrshire Agricultural Science Association, and it is expected that an accurate dairy record will be kept on at least a dozen farms. Regular analyses will be made of the milk, not only of each farm but of the milk supplied by each cow on the farm included in the experiment; and I am hopeful that the result will be the amassing of an amount of information that will point the way towards improving the value of the breed and economically increasing the quantity and improving the quality of the milk and its produce.

Analytical Associations.—Twenty Associations have during the past season been conducting their operations in conformity with the Society's regulations, and have sent in reports entitling them to a share in the annual grant in aid of analyses. In all, 208 analyses have been reported, and the amount of the grant in respect of these is £87, 5s.

There are no cases of great deficiency or of gross overcharge to report this year. Such instances of minor deficiency as have occurred admit for the most part of satisfactory explanation, and there remain only four which are still under investigation with a view to publishing the details should that be thought necessary.

There is one matter to which the Committee desires me to call attention. About one-fourth of the manures supplied to members of Associations under the name of dissolved bones show by their analyses that they are not genuine. It has been for many years the custom in the manure trade to sell under the name of "dissolved bones" a number of compounds which contained some bone material that might or might not be dissolved, and in some instances which contained no bone material whatever. The Society drew the attention of some of the leading manure merchants to this anomaly some years ago, and desired that it should be put a stop to. The manufacturers sympathised with this desire, but expressed themselves unable to prevent the abuse. Since then the passing of the "Merchandise Marks Act" has rendered it illegal to sell goods under a false name, and those who now persist in selling under the name of dissolved bones anything which is not genuine dissolved bones, are liable to prosecution. In the interest of farmers and the better class of manure manufacturers, who are subjected to unfair competition in these matters, the Committee are prepared to assist Associations or members of the Society in their efforts to suppress this illicit traffic.

The units for the valuation of manures during the coming season are now in course of preparation, and will shortly be issued.

BOTANICAL DEPARTMENT.

Mr A. N. M'ALPINE said: My botanical work during the present season has been devoted in the main to the solution of problems concerning the germination of grass seeds. In connection with this matter I have examined over one thousand samples of grass seeds sent from all parts of Britain and of the Continent. The main point to be determined was, Why is the germination not 100 per cent? The experiments show that the great reason for deficiency in germination is the presence of chaff or of immature seeds. To this must be added the diseased seeds (seldom over 10 per cent), and in old samples, the seeds dead from changes accompanying age. The germinating power is, accordingly, one hundred, with the percentage of chaff, diseased seeds, and dead seeds deducted.

In experimenting on the *rapidity of germination*, it is usually found that the rapidity diminishes with the age of the sample, although, as in the present season, even fresh seed may be abnormally slow, but this is not usually so.

It is advisable, therefore, to use fresh seed from which the chaff and immature parts have been blown away, for only then can the effect of the sown seed be gauged, and its purchase value properly estimated. In other words, the most profitable seed to use is that of high purity and high germination.

To facilitate the determination of the purity of small seeds, various new appliances connected with the lantern, and with the microscope, have been devised.

The following remarks were made upon the seeds of the present season: *Ryegrass*—Germination lower than usual, on account of the presence of an abnormal number of unhealthy (dyspeptic) seeds. *Meadow fescue*—New Zealand tall fescue is often mixed with it, and sometimes perennial ryegrass. *Tall fescue*—New Zealand tall fescue is often substituted for this. *Hard fescue*—Low germination is, as a rule, due to the high percentage of chaff. *Meadow foxtail*—Low germination mainly due to the immature seed and chaff. *Sweet vernal*—It appears still to be the custom among some merchants to substitute Puel's sweet vernal for this. *Smooth-stalked meadow-grass*—Dearer than usual. *Rough-stalked meadow-grass*—It is not profitable this season to substitute smooth-stalked meadow-grass for it. *Timothy*—Excellent germi-

nation as a rule. *White clover*—A number of inferior samples have reached me this season. *Cow grass*—Merely a superior quality of red clover.

FORESTRY DEPARTMENT.

Sir ROBERT MENZIES proposed an addition to the bye-laws by which holders of first-class certificates in forestry should be made free life members of the Society.

The motion was agreed to.

In terms of the charter the subject requires to be confirmed by the next General Meeting.

PROPOSED CHAIR OF FORESTRY.

Sir ROBERT MENZIES, Bart., reported that in accordance with the recommendation of the Committee in Forestry, and approved of by the Board at their meeting on 5th November last, the following petition praying for the establishment of a Chair of Forestry in the University of Edinburgh had been presented to Her Majesty's Commissioners for the Scottish Universities:—

“Unto Her Majesty's Commissioners for the Scottish Universities, the Memorial of the Highland and Agricultural Society of Scotland, incorporated by Royal Charter,

Showeth—That the Directors of the Highland and Agricultural Society of Scotland, having regard to the present most favourable opportunity of taking action in a matter which vitally affects the rural interests of this country, desire to bring before Her Majesty's Commissioners for the Scottish Universities the desirability of giving permanency to the teaching of forestry in the University of Edinburgh by the institution of a suitably endowed Chair.

“That there does exist in this country a real desire for instruction in practical and scientific forestry, is evident from the many attempts that have from time to time been made to supply such instruction. At no time, however, has the necessity for education in forestry been more felt than at present, when attention is being strongly directed to the extension of sylvicultural operations in providing the means of profitably utilising much of the waste land of the Highlands of Scotland, besides furnishing remunerative employment to a large number of the rural population. There is also the certainty that in the near future the supply of foreign timber must be seriously curtailed, and plantations which are now formed on right principles will meet the want, when it occurs, to the great benefit of the proprietors and the country generally.

“That the Directors of this Society are strongly of opinion that the University of Edinburgh offers exceptional advantages as a place in which to provide higher instruction in the science of forestry. Not only is it within easy reach of the Royal Botanic Garden and of the Industrial Museum, where valuable collections of woods and other forest products are accessible to students, as well as in the neighbourhood of the Arboretum, and many private woodlands, in which practical demonstrations could be given; but it is attended each year by a very considerable number of students who are qualifying themselves for the management of landed estates, and for them instruction in forestry must be regarded as of the utmost importance.

“That your memorialists would also express the opinion that forestry is a subject essential to the completeness of a degree in agriculture; and therefore, at a time when the whole administration of the University of Edinburgh is being revised, they would respectfully urge upon the Scottish Universities Commissioners the desirability of including forestry in the degree of bachelor of science in the department of agriculture.

“That in the event of the Scottish Universities Commission being unable to recommend the endowment of a Chair of Forestry, unless external assistance is forthcoming, your memorialists believe that, on an intimation to that effect being given, a considerable fund could be raised by an appeal to the public, and in this belief they are strengthened by the fact that a member of this Society is ready at any time to hand over to such a fund the sum of £1000, besides providing books and money sufficient to establish a forest library of the first rank.

“Your petitioners, therefore, pray that the Commissioners will take the foregoing memorial into their consideration, with the views of establishing a Chair of Forestry in the University of Edinburgh.

(Signed)

“JAMES M'QUEEN, *Chairman*.

“EDINBURGH, 5th November 1890.”

The report was approved.

FORESTRY CHAIR ENDOWMENT FUND.

Sir ROBERT MENZIES of Menzies, Bart., Convener of the Society's Committee on Forestry, gave in the following report:—

"At a meeting of the Directors of the Highland and Agricultural Society of Scotland, held on 7th January 1891, it was unanimously resolved that the time has now come when a strenuous effort should be made to provide permanent facilities for the study of the important subject of forestry.

"The promoters of the Forestry Exhibition of 1884 had in view the encouragement of the teaching of forestry, for which, unfortunately, the surplus funds were quite insufficient. Subsequently, a strong representation was made to Government, and a Select Committee of the House of Commons made forestry education the subject of special inquiry, and reported that 'nearly every other civilised State possesses one or more forest schools;' that 'the witnesses examined before the Committee have been generally and strongly of opinion that the establishment of forest schools, or at any rate of some organised system of forest instruction, would be very desirable;' and that 'a school for Scotland is also urgently needed.'

"It is believed that the necessities of the case will be best met by the establishment of a Chair of Forestry in the University of Edinburgh. In this way instruction in forestry will be placed within the reach of all who may be studying rural economy generally, and the classes in cognate subjects (*e.g.*, botany, entomology, field engineering, &c.) will also be available for those who intend to make forestry their profession. The wants of those unable to attend the University can be met by means of evening lectures at the Botanic Garden or elsewhere, and it will also be practicable to hold short courses during summer in various districts of Scotland. With Edinburgh as the centre of forest education, the Arboretum and Botanic Garden, as well as the collections in the Museum of Science and Art, can be advantageously utilised, and excursions to the neighbouring woods and nurseries will afford the opportunity of practical demonstration. Facilities will also be afforded to young men who may wish to hold a forestry diploma to enable them to obtain good positions in forestry at home and abroad.

"It is proposed to provide the salary of the professor by asking proprietors and others to contribute towards a fund capable of yielding not less than £200 per annum, and by approaching the Government, through the Board of Agriculture, with a view of procuring a grant for the like amount. It may be expected that the Universities Commission will then place the Chair of Forestry on an equal footing with other chairs in the University, and provide suitable accommodation for efficient instruction.

"It need scarcely be pointed out what immense advantages will ultimately result to Scotland when the woods are managed by men who have been instructed in the sound principles of modern sylviculture. It is confidently expected, therefore, that all interested in the prosperity of our woodlands will respond liberally and promptly to this appeal, and thus accord to Scotland the advantages so long enjoyed by other civilised countries.

"It is felt by many that the establishment of an independent forest school in a woodland district is not the most desirable object to aim at in the present condition of forestry in this country. Besides necessitating an initial expenditure upon buildings and equipment of several thousand pounds, the fund for its endowment alone would require to yield not less than £1200 per annum. Such a school would also possess the disadvantage of being beyond the reach of all who study with the view of qualifying for factorship, or the supervision of landed property generally, and for whom it is desirable that instructions in the principles of forestry should be provided.

"One subscription for £1000 has been already received by the Edinburgh University, and Dr Cleghorn has placed the sum of £200, as a surplus accruing from his testimonial fund, in the hands of trustees, to be expended in the purchase of a select forest library.

"It was remitted to the Forestry Committee, and Sir Robert Menzies, Bart., the Convener of the Committee, to carry out the above resolution, and to solicit subscriptions.

"Those wishing to contribute to the fund will please send their subscriptions to F. N. Menzies, Secretary, 3 George IV. Bridge, Edinburgh."

The report was adopted.

DAIRY DEPARTMENT.

The CHAIRMAN gave in the report of the Dairy Department, which stated that the Directors had awarded the £100 grant to the Kilmarnock Dairy School. The Directors noted with pleasure that the interest created by the Dairy School had already caused increased attention to improving the quality of dairy produce in many districts

where the subject had been neglected. The Directors also regretted that the acidity test had in their examination not come up to the required standard, and they had to withhold the prize.

It was agreed to continue the £100 grant for another year.

GOVERNMENT GRANT.

Mr MENZIES, the Secretary, stated that the Board of Agriculture had been asked to give a grant to supplement the cost of the Society's experiments. The Board were at present considering the subject.

THE PLEURO-PNEUMONIA ORDER.

Sir JAMES GIBSON-CRAIG reported, with regard to the new Pleuro-Pneumonia Order, that it was quite evident that the matter was now taken out of their hands by the Board of Agriculture, and that the Society would have no further power with respect to the regulations for the movement of cattle.

The report was approved.

PREMIUMS FOR REPORTS.

The Hon. The MASTER OF POLWARTH, in the absence of the Rev. John Gillespie, Convener of the Committee on Publications, reported the premiums awarded for reports lodged in November 1890, and those offered in 1891.

The report was approved.

DISTRICT SHOWS AND COTTAGES AND GARDENS.

Mr BUTTAR, Corston, reported the premiums awarded in 1890, and those offered in 1891.

The report was adopted.

THE RAILWAY RATES COMMISSION.

Mr SCOTT DUDGEON, Longnewton, asked why there was no report from the Railway Rates Committee? He thought the report of the Commission was anything but satisfactory to agriculturists, and he hoped the Committee would still press the subject upon the Board of Trade.

The SECRETARY replied that the Committee had not reported because the matter was not yet exhausted. The Committee was still in existence.

This concluded the business, and a vote of thanks to the Chairman brought the proceedings to a close.

PREMIUMS AWARDED BY THE SOCIETY IN 1890.

I.—REPORTS.

1. Dr William Somerville, 1 Braid Crescent, Edinburgh, for a Report on the Pine Beetle .	£15 0 0
2. Ernest William Grant Govan, Glengyle, Perthshire, for a Report on raising Poultry .	5 0 0
3. William Irving, 64 High Street, Dumfries, for a Report on the same subject .	5 0 0
4. A. D. Webster, Hollydale, Keston, Kent, for a Report on the Utilisation of Waste Produce of Forests and Woodlands .	5 0 0
5. A. C. Forbes, 16 Roseburn Terrace, Edinburgh, for a Report on the Natural Regeneration of Scots Fir Woods .	5 0 0
6. W. Irvine Fortescue, 26 Dundas Crescent, Kirkwall, for a Report on the best means of preventing the rapid extinction of the Lobster .	3 0 0
7. James G. Bertram, 331 St Vincent Street, Glasgow, for a Report on the same subject .	3 0 0
8. Robert Menzies, Haverland, Norwich, for a Report on the Jersey Creamer .	3 0 0
	£44 0 0

II.—DUNDEE SHOW, 1890.

ABBREVIATIONS.—V. H. C., *Very Highly Commended*. H. C., *Highly Commended*. C., *Commended*.

CLASS I.—CATTLE.

SHORTHORN.

Breeder of Best Bull. Lord Polwarth, Mertoun, St Boswells, "Flag of Truce" Silver Medal £0 14 0

SECTION 1. BULL, calved before 1st January 1888.

1. Horatio Ross MacRae, of Clunes, Bogroy, Inverness, "Royal Sceptre" (54,987) .	20 0 0
2. William James Matheson, Newton, Novar, Evanton, Ross-shire, "Salisbury" (56,523) .	10 0 0
3. William Peterkin, Dunglass, Canon Bridge, "Sunray" (56,623) .	5 0 0
C.—James Douglas Fletcher, of Rosehaugh, Inverness, "Duke of Brailles 14th" (57,177).	

SECTION 2. BULL, calved on or after 1st January 1888.

1. Lord Polwarth, Mertoun House, St Boswells, "Flag of Truce" .	15 0 0
2. James M'William, Stoneytown, Keith, "Eastern Star" .	10 0 0
3. James Thomson, Dunninald, Montrose, "Mediator" .	5 0 0

SECTION 3. BULL, calved on or after 1st January 1889.

1. Lord Polwarth, Mertoun House, St Boswells, "Windsor Royal" .	12 0 0
2. Hugh F. Rose, of Holme Rose, Fort George Station, "Farmer's Fancy" .	8 0 0
3. W. J. Matheson, Newton, Novar, Evanton, Ross-shire, "Colorado" .	4 0 0

Carry forward . . . £89 14 0

Brought forward . . . £89 14 0

SECTION 4. COW, of any Age.

1. Lord Polwarth, Mertoun House, St Boswells, "Wave of Loch Leven"	12	0	0
2. James Scott, Softlaw East Mains, Kelso, "Rosebud 11th"	8	0	0
3. James M'William, Stonetown, Keith, "Mermaid"	4	0	0

SECTION 5. HEIFER, calved on or after 1st January 1888.

1. Lord Polwarth, Mertoun House, "Truth"	10	0	0
2. Lord Polwarth, Mertoun House, "Countess of Irwin"	5	0	0
3. James M'William, Stonetown, Keith, "Maud"	3	0	0
C.—James Douglas Fletcher of Rosehaugh, Inverness, "Arizona 3d."			

SECTION 6. HEIFER, calved on or after 1st January 1889.

1. Lord Polwarth, Mertoun House, "Gladstone Wave"	10	0	0
2. James M'William, Stonetown, Keith, "Golden Gift"	5	0	0
3. John Smith, Balmain, Fettercairn, "Averne 9th"	3	0	0

AYRSHIRE.

Breeder of Best Bull. William Bartlemore, Nether Houses, Lochwinnoch, "Traveller" (1441) . . . Silver Medal 0 14 0

SECTION 7. BULL, calved before 1st January 1888.

1. Andrew Mitchell, Barcheskie, Kirkcudbright, "Traveller" (1441)	15	0	0
2. Robert Montgomerie, Lessnessock, Ochiltree, "Lord Glencairn" (1818)	10	0	0
3. Hugh Drummond, Craighead, Mauchline, "Wallace 2d" (1534)	5	0	0

SECTION 8. BULL, calved on or after 1st January 1888.

1. Robert Osborne, Drumjoan, Ochiltree	12	0	0
2. R. H. Walker of Hartwood, West Calder, "Father O'Flynn"	8	0	0

SECTION 9. BULL, calved on or after 1st January 1889.

1. Robert Osborne, Drumjoan, Ochiltree	8	0	0
2. John Lindsay, Dunlop, Castle Douglas, "Lord of the Isles"	5	0	0
3. Mark J. Stewart of Southwick, M.P., Dumfries, "Blossoming Heather"	3	0	0
V. H. C.—Mark J. Stewart of Southwick, M.P., Dumfries, "Hover a Blink." H. C.—Andrew Allan, Munnock, Dalry, "Hard Cash."			
C.—Andrew Mitchell, Barcheskie, Kirkcudbright, "Blair Athole."			

SECTION 10. COW in Milk, of any Age.

1. Alexander Cross of Knockdon, Maybole	12	0	0
2. William Holmes of Hairlaws, Bridge of Weir, "Broom Blossom"	8	0	0
3. Alexander Cross of Knockdon, Maybole	4	0	0

SECTION 11. COW in Calf, of any Age.

1. James Wilson, Boghall, Houston, "Susie"	10	0	0
2. John Holm, Japston, Neilston, N.B., "White Rose" (5291)	7	0	0
3. James Risk, Drumbrae, Bridge of Allan, "Peggy"	3	0	0

SECTION 12. HEIFER, calved on or after 1st January 1888.

1. Andrew Allan, Munnock, Dalry, "Dinah 5th"	10	0	0
2. Mark J. Stewart of Southwick, M.P., Dumfries, "Nellie"	5	0	0
3. R. H. Walker of Hartwood, West Calder, "Nellie"	3	0	0
V. H. C.—Mark J. Stewart of Southwick, M.P., Dumfries, "Betty 2d of Southwick."			

SECTION 13. HEIFER, calved on or after 1st January 1889.

1. Robert Wardrop, Garlaff, Cumnock, "Lady Kate"	8	0	0
2. Andrew Mitchell, Barcheskie, Kirkcudbright, "Sunray"	5	0	0
3. Andrew Mitchell, Barcheskie, Kirkcudbright, "Hyacinth"	3	0	0
V. H. C.—Robert Wardrop, Garlaff, Cumnock, "Jemima." H. C.—Andrew Allan, Munnock, Dalry, "Rhoda 3d." C.—John Holm, Japston, Neilston, N.B., "Lady."			

Carry forward . . . £294 8 0

Brought forward . . . £294 8 0

ABERDEEN-ANGUS.

<i>Best Bull.</i> Given by Miss Morison Duncan of Naughton.—The Dowager Countess of Seafield, Cullen House, Cullen, "Epigram" (6016)	10 0 0
<i>Breeder of Best Bull.</i> —Lord Tweedmouth, Guisachan, Beaully, "Epigram" (6016) Silver Medal	0 14 0
<i>Best Female.</i> Given by Mrs Morison Duncan of Naughton.—Lord Tweedmouth, Guisachan, Beaully, "Pride of Guisachan 20th" (13,161)	10 0 0

SECTION 14. BULL, calved before 1st December 1887.

1. The Dowager Countess of Seafield, Cullen House, Cullen, "Epigram" (6016)	20 0 0
2. Arthur Egginton, South Ella, Hull, "Ensign of Guisachan" (6011)	10 0 0
3. The Earl of Airlie, Cortachy Castle, Kirriemuir, "Rover of Powrie" (4991)	5 0 0
V. H. C.—George Smith Grant, Auchorachan, Glenlivet, Ballindalloch, "Champagne" (4565). H. C.—George Willsher, Pitpointie, Auchterhouse, Dundee, "Fitz Lyon" (6056). C.—James Douglas Fletcher of Rosehaugh, Inverness, "Lord Fitzroy of Rosehaugh" (6911).	

SECTION 15. BULL, calved on or after 1st December 1887.

1. James Douglas Fletcher of Rosehaugh, Inverness, "Prince of Euston" (7851)	15 0 0
2. Lord Tweedmouth, Guisachan, Beaully, "Field Marshal of Guisachan" (6727)	10 0 0
3. Clement Stephenson, Sandyford Villa, Newcastle-on-Tyne, "Albion" (6525)	5 0 0
H. C.—The Earl of Strathmore, Glamis Castle, Glamis, "Figaro" (6728). C.—William Hay, Sutton Hall, "Pommery" (7069).	

SECTION 16. BULL, calved on or after 1st December 1888.

1. Arthur Egginton, South Ella, Hull, "Epson" (7507)	12 0 0
2. Lord Tweedmouth, Guisachan, Beaully, "Guinea" (7576)	8 0 0
3. Clement Stephenson, Sandyford Villa, Newcastle-on-Tyne, "Albert Edward" (7293)	4 0 0
V. H. C.—James T. Cathcart, yr. of Pitcairrie, Auchtermuchty, "Julius Caesar" (7637). H. C.—J. G. Macgregor, Fearn Farm, Fearn, "Elkinton" (7491). C.—The Earl of Strathmore, Glamis Castle, Glamis, "Beyrout" (7343). William Whyte, Spott, Kirriemuir, "Brave Briton" (7385).	

SECTION 17. COW, calved before 1st December 1886.

1. George Wilken, Waterside of Forbes, Alford, Aberdeenshire, "Waterside Elena" (11,954)	12 0 0
2. Miss C. H. A. Morison Duncan of Naughton, Newport, Fife, "Melissa Grace" (10,569)	8 0 0
3. Her Majesty the Queen, Abergeldie Mains, Ballater, "Princess Irene" (5057)	4 0 0
V. H. C.—Thomas Smith, Powrie, Dundee, "Ruby 13th of Powrie" (10,557). H. C.—Thomas Ferguson, Kinochtry, Coupar-Angus, "Princess Eliza of Kinochtry" (8461). C.—W. S. Ferguson, Pictstonhill, Perth, "Princess C. of Scone" (8476). William Whyte, Spott, Kirriemuir, "Belle 9th" (10,748). Miss C. H. A. Morison Duncan of Naughton, Newport, Fife, "Highland Pride" (11,077).	

SECTION 18. COW, three years old. Given by Mr Macpherson Grant of Drumduan.

1. Lord Tweedmouth, Guisachan, Beaully, "Pride of Guisachan 20th" (13,161)	12 0 0
2. The Marquis of Huntly, Aboyne Castle, Aboyne, "St Agnes" (13,839)	8 0 0
3. Andrew Mackenzie, Dalmore, Alness, "Attraction 2d" (12,616)	4 0 0

Carry forward . . . £452 2 0

Brought forward . . . £452 2 0

- V. H. C.—Arthur Egginton, South Ella, Hull, "Violet of Benton" (13,090). H. C.—Miss C. H. A. Morison Duncan of Naughton, Newport, Fife, "Pride of Pedigree" (12,282). C.—Patrick Stirling of Kippendavie, Kippencross Home Farm, Dunblane, "Fenella of Kippendavie" (13,129).

SECTION 19. HEIFER, calved on or after 1st Dec. 1887.

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|--|--------|
| 1. The Marquis of Huntly, Aboyne Castle, Aboyne, "St Agatha" (13,838) . . . | 10 0 0 |
| 2. George Reid, Ladywell, Kirriemuir, "Spirea 4th" (14,110) . . . | 5 0 0 |
| 3. Andrew Mackenzie, Dalmore, Alness, "Pride of Dalmore 4th" (13,914) | 3 0 0 |
| V. H. C.—The Countess Dowager of Seafeld, Cullen House, Cullen, "Waterside Violet 2d" (14,503). H. C.—Miss C. H. A. Morison Duncan of Naughton, Newport, Fife, "Pipetune" (13,564). C.—George Willsher, Pitpointie, Auchterhouse, Dundee, "Rosina of Pitpointie" (15,821). | |

SECTION 20. HEIFER, calved on or after 1st Dec. 1888.

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|--|--------|
| 1. Arthur Egginton, South Ella, Hull, "Black Empress" (14,861) . . . | 10 0 0 |
| 2. George Smith Grant, Auchorachan, Glenlivet, Ballindalloch, "Royal Diamond" (15,071) . . . | 5 0 0 |
| 3. William Whyte, Spott, Kirriemuir, "Jude" (15,798) . . . | 3 0 0 |
| V. H. C.—William Whyte, Spott, Kirriemuir, "Gipsy 8th" (15,796). H. C.—Lord Tweedmouth, Guisachan, Beaulieu, "Gladys of Guisachan" (15,746). C.—The Earl of Strathmore, Glamis Castle, Glamis, "Penitence" (15,723). Her Majesty the Queen, Abergeldie Mains, Ballater, "Princess Beatrice 3d." The Earl of Strathmore, Glamis Castle, Glamis, "Bandoline" (15,713). | |

GALLOWAY.

- Breeder of Best Bull.*—Robert Webster, Airds, New Galloway, "Lucky Times" (3058) . . . Silver Medal 0 14 0

SECTION 21. BULL, calved before 1st January 1888.

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|--|--------|
| 1. James Cunningham, Tarbreoch, Dalbeattie, "Lucky Times" (3058) . . . | 20 0 0 |
| 2. Sir Robert Jardine of Castlemilk, Bart., M.P., Lockerbie, "Liberator of Balig" (3850) . . . | 10 0 0 |

SECTION 22. BULL, calved on or after 1st January 1888.

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|---|--------|
| 1. John Robertson, Burnfoot, Hawick, "Henry of Tarbreoch" (4847) . . . | 15 0 0 |
| 2. R. & J. Shennan, Balig, Kirkcudbright, "Crown Jewel" (4853) . . . | 10 0 0 |
| 3. H. G. Murray Stewart of Cally, Gatehouse, N.B., "Sir Frederick Graham 3d" (4856) . . . | 5 0 0 |

SECTION 23. BULL, calved on or after 1st January 1889.

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|---|--------|
| 1. James Cunningham, Tarbreoch, Dalbeattie, "Cedric of Tarbreoch" (5060) . . . | 12 0 0 |
| 2. Thomas Biggar & Sons, Chapelton, Dalbeattie, "Viking" (5021) . . . | 8 0 0 |
| 3. Sir Robert Jardine of Castlemilk, Bart., M.P., Lockerbie, "Grenadier of Castlemilk" (4995) . . . | 4 0 0 |
| V. H. C.—James Cunningham, Tarbreoch, Dalbeattie, "Macdougall 2d of Tarbreoch" (5064). | |

SECTION 24. COW, of any Age.

- | | |
|---|--------|
| 1. James Cunningham, Tarbreoch, Dalbeattie, "Tarbreoch Lizzie 3d" (9680) . . . | 12 0 0 |
| 2. Thomas Biggar & Sons, Chapelton, Dalbeattie, "Violet 2d" (10,509) . . . | 8 0 0 |
| 3. James Cunningham, Tarbreoch, Dalbeattie, "Vendetta of Closeburn" (8132) . . . | 4 0 0 |
| V. H. C.—James Cunningham, Tarbreoch, Dalbeattie, "Lady Stanley 10th" (5425). H. C.—Thomas Biggar & Sons, Chapelton, Dalbeattie, "Caprice 3d" (9500). C.—Sir Robert Jardine of Castlemilk, Bart., M.P., Lockerbie, "Mignonette" (9542). | |

Carry forward . . . £596 16 0

Brought forward . . . £596 16 0

SECTION 25. HEIFER, calved on or after 1st January 1888.

1. James Cunningham, Tarbreoch, Dalbeattie, "Madonna 2d of Tarbreoch" (11,056)	10 0 0
2. James Cunningham, Tarbreoch, Dalbeattie, "Maggie 3d of Tarbreoch" (11,066)	5 0 0
3. Lord Polwarth, Mertoun House, St Boswells, "Emerald" (11,397)	3 0 0
V. H. C.—Thomas Biggar & Sons, Chapelton, Dalbeattie, "Countess of Murray 2d" (11,368). H. C.—Sir Robert Jardine of Castlemilk, Bart., M.P., Lockerbie, "Lady Isabella Douglas 2d of Castlemilk" (10,983).	

SECTION 26. HEIFER, calved on or after 1st January 1889.

1. James Cunningham, Tarbreoch, Dalbeattie, "Madonna 3d of Tarbreoch" (11,532)	10 0 0
2. Thomas Biggar & Sons, Chapelton, Dalbeattie, "Mary Graham" (11,595)	5 0 0
3. James Cunningham, Tarbreoch, Dalbeattie, "Scottish Queen" (11,524)	3 0 0
V. H. C.—Sir Robert Jardine of Castlemilk, Bart., M.P., Lockerbie, "Nancy 10th of Castlemilk" (11,492).	

HIGHLAND.

<i>Best Bull.</i> Given by Mr Ogilvy Dalgleish of Errol Park.—D. A. Stewart, Ensay, Obbe, "Graidhean" (763)	10 0 0
<i>Best Female.</i> Given by Mr Ogilvy Dalgleish of Errol Park.—Thomas Valentine Smith of Ardtornish, Oban, "Sgiathach 2d" (1730)	10 0 0
<i>Breeder of Best Bull.</i> —John Stewart of Ensay, "Graidhean" (763). Silver Medal	0 14 0

SECTION 27. BULL, calved before 1st January 1888.

1. D. A. Stewart, Ensay, Obbe, "Graidhean" (763)	20 0 0
2. John Stewart of Ensay, Obbe, Portree, "Scarbhaidh" (814)	10 0 0
3. Allan MacGillivray, Gordon Hall, Kingussie, "Fear Riabhach" (745)	5 0 0
V. H. C.—The Earl of Southesk, K.T., Kinnaird Castle, Brechin, "Iain Chaluim" (667). H. C.—J. Campbell of Kilberry, Argyllshire, "Craigfeanndagach" (726). C.—Sir Donald Currie, K.C.M.G., of Garth and Glenlyon, M.P., Aberfeldy, "Mac-an-Fhraoich" (679).	

SECTION 28. BULL, calved on or after 1st January 1888.

1. The Earl of Southesk, K.T., Kinnaird Castle, Brechin, "Sargou" (813)	15 0 0
2. John Stewart of Ensay, Obbe, Portree, "An-t-Ailleagan"	10 0 0
3. John Stewart, Bochart, Callendar, "Paraig Dubh" (794)	5 0 0
V. H. C.—J. Hume Webster, Marden Deer Park, Caterham Valley, Surrey, "Glen Dubh 2d" (759). H. C.—J. Campbell of Kilberry, Argyllshire, "Talisman" (822).	

SECTION 29. BULL, calved on or after 1st January 1889.

1. Thomas Valentine Smith of Ardtornish, Morvern, N.B., "Valentine 2d"	12 0 0
2. The Duke of Sutherland, K.G., Shinness Lairg, "Ben-Armine"	8 0 0
3. The Duke of Athole, K.T., Blair Castle, Blair Athole, "Donull Riabhach"	4 0 0
V. H. C.—The Duke of Athole, K.T., Blair Castle, Blair Athole, "Donull Dubh." H. C.—Thomas Valentine Smith of Ardtornish, Morvern, N.B., "Victor 4th." C.—Alexander Macdonald, Barranald, Lochmaddy, "Rhunera."	

Carry forward . . . £742 10 0

Brought forward . . . £742 10 0

SECTION 30. COW, of any Age.

1. John Stewart, Bochartle, Callander, "Mairi Dhubh" (1299) . . .	12 0 0
2. J. Campbell of Kilberry, Argyllshire, "Baravalla" (932) . . .	8 0 0
3. The Duke of Athole, K.T., Blair Castle, Blair Athole, "Beauty of Athole" (21) . . .	4 0
V. H. C.—The Marquis of Breadalbane, Taymouth Castle, Aberfeldy, "Phroiseag" (916). H. C.—The Duke of Athole, K.T., Blair Castle, Blair Athole, "Chaisfhoinn Bhuidhe" (24). C.—J. Campbell of Kilberry, Argyllshire, "Ribhinn of Kilberry (96)." . . .	

SECTION 31. HEIFER, calved on or after 1st January 1887.

1. Thomas Valentine Smith of Ardtornish, Oban, "Sgiathach 2d" (1730) . . .	10 0 0
2. Thomas Valentine Smith of Ardtornish, Oban, "Ban Mhuileach 2d" (1704) . . .	5 0 0
3. J. Hume Webster, Maiden Deer Park, Caterham Valley, Surrey, "Nora of Sutherland" (1834) . . .	3 0 0
V. H. C.—The Marquis of Breadalbane, Taymouth Castle, Aberfeldy, "Mysie 3d." H. C.—John Stewart of Ensay, Obhe, Portree, "Sobhrag" (1802). C.—D. A. Stewart, Ensay, Obhe, "Guanach 2d of Balelone" (1793). . . .	

SECTION 32. HEIFER, calved on or after 1st January 1888.

1. John Stewart of Bochartle, Callander, "Mairi Bhuidhe" . . .	10 0 0
2. Thomas Valentine Smith of Ardtornish, Morvern, N.B., "Clementina 3d" (1711) . . .	5 0 0
3. John Stewart of Bochartle, Callander, "Proiseag Bhuidhe 3d" (1811) . . .	3 0 0
V. H. C.—D. A. Stewart, Ensay, Obhe, "Targheal 3d of Balelone" (1797). H. C.—The Duke of Athole, K.T., Blair Castle, Blair Athole, "Annag Riabhach 1st." C.—The Duke of Athole, K.T., Blair Castle, Blair Athole, "Beauty 2d." . . .	

EXTRA CATTLE.

Very Highly Commended.

Hugh F. Rose of Holme Rose, Fort George, Shorthorn Heifer, "Florence 12th" . . .	Medium Gold Medal	5 10 0
Wm. Ogilvy Dalglish of Errol Park, Highland Ox . . .		5 0 0
Thomas Ferguson, Kinochtry, Coupar-Angus, Aberdeen Angus Heifer . . .		5 0 0
William Watt, Dura Mains, Coupar Fife, Cross Ox . . .	Medium Gold Medal	5 10 0

Highly Commended.

Wm. Ogilvy Dalglish of Errol Park, Errol, Highland Ox . . .		3 0 0
William Watt, Dura Mains, Coupar Fife, Cross Ox . . .	Minor Gold Medal	3 6 0

Commended.

David Hume, Barrelwell, Brechin, Jersey Cow, "Lily" . . .	Silver Medal	0 14 0
John Kennedy, 22 Step Row, Perth Road, Dundee, Dutch Cow . . .	Silver Medal	0 14 0

£831 4 0

CLASS II.—HORSES.

FOR AGRICULTURAL PURPOSES.

<i>Best Male</i> , registered in Clydesdale Stud Book. Given by the Clydesdale Horse Society.—William Renwick, Meadowfield, Corstorphine, "Prince Alexander"	£25 0 0
<i>Best Female</i> , registered in Clydesdale Stud Book. Given by the Clydesdale Horse Society.—David Riddell, Blackhall, Paisley, "Sunrise"	25 0 0
<i>Breeder of Best Male</i> .—Alexander Black, Craigen-crosh, Stoneykirk.	Silver Medal
	0 14 0

Carry forward . . . £50 14 0

Brought forward . . . £50 14 0

SECTION 1. STALLION, foaled before 1st January 1887.

1. John Gilmour of Montrave, Leven, "Prince of Albion" (6178)	20 0 0
2. David Riddell, Blackhall, Paisley, "Bonnie Prince"	15 0 0
3. Peter Crawford, Carruchan, Dumfries, "Look Again" (5972)	10 0 0
4. William Renwick, Meadowfield, Corstorphine, "Height o' Splendour" (6836)	5 0 0
V. H. C.—Robert Campbell, Craichmore, Stranraer, "Craichmore Darnley" (5667). H. C.—William Cullen, Barbeggs, Croy, Kilsyth, "M'Vicar" (5204).	

SECTION 2. ENTIRE COLT, foaled on or after 1st January 1887.

1. Wm. Renwick, Meadowfield, Corstorphine, "Darnley's Last" (6663)	15 0 0
2. David Riddell, Blackhall, Paisley, "Conspiracy"	12 0 0
3. Peter Crawford, Carruchan, Dumfries, "Lawrence's Heir" (6931)	8 0 0
4. Peter Crawford, Carruchan, Dumfries, "Master Young"	4 0 0
V. H. C.—James Clews, Woodneuk, Barrhead, "Ayrshire." H. C.—William Renwick, Meadowfield, Corstorphine, "St Stephen" (7231). C.—Alexander M'Robbie, Sunnyside, Aberdeen, "Prince William" (6713).	

SECTION 3. ENTIRE COLT, foaled on or after 1st January 1888.

1. Peter Crawford, Carruchan, Dumfries, "Prince of Carruchan" (8151)	15 0 0
2. James Johnston, Lochburnie, Maryhill, "Orlando" (8092)	10 0 0
3. Peter Crawford, Carruchan, Dumfries, "Lawrence Again" (7909)	6 0 0
4. Alexander Scott, Berryyards Farm, Upper Greenock, "Lawrence Chief" (7910)	3 0 0
V. H. C.—George Bean, Balquhain Mains, Pitcaple, "Mount Royal" (8065). H. C.—W. H. Lumsden of Balmedie, Aberdeenshire, "Balmedie Prince" (7454). C.—William Clark, Netherlea Farm, Cathcart, "Williamwood" (8391).	

SECTION 4. ENTIRE COLT, foaled on or after 1st January 1889.

1. William Renwick, Meadowfield, Corstorphine, "Prince Alexander"	12 0 0
2. R. & J. M'Alister, Mid Ascog, Rothesay, "Rosemount"	7 0 0
3. Peter Crawford, Carruchan, Dumfries	4 0 0
4. Matthew Marshall, Stranraer	2 0 0
V. H. C.—James Johnston, Lochburnie, Maryhill, "William the Conqueror." H. C.—David Wilkie, Linbank, Dollar, "Prince of Mull." C.—Peter Crawford, Carruchan, Dumfries.	

SECTION 5. MARE of any age (with Foal at foot).

1. R. Sinclair Scott, Craigievar, Skelmorlie, "Scottish Marchioness"	20 0 0
2. John Galbraith, Croy Cunningham, Killearn, "Topsman's Princess" (8403)	10 0 0
3. George Shepherd, Shethin, Tarves, "Lady Erskine"	5 0 0
4. John Macnab of Kinglassie, Kirkcaldy, "Rosie"	3 0 0

SECTION 6. MARE (in Foal), foaled before 1st January 1887.

1. David Riddell, Blackhall, Paisley, "Sunrise"	15 0 0
2. Sir James Duke, Bart., Laughton, Sussex, "Princess II."	10 0 0
3. W. H. Lumsden of Balmedie, Aberdeenshire, "Lady Marjory Erskine" (7492)	5 0 0
5. John Marr, Cairnbrogie, Old Meldrum, "Zehnet" (7810)	3 0 0
V. H. C.—Robert Wilson, Manswrae, Kilbarchan, "Lily" (9310). H. C.—John Galbraith, Croy Cunningham, Killearn, "Flower of Endrick" (8404). C.—Edward Balfour, yr. of Balbirnie, Markinch, "Rosanna."	

Carry forward . . . £269 14

Brought forward . . . £269 14 0

SECTION 7. FILLY, foaled on or after 1st January 1887.

1. John Gilmour of Montrave, Leven, "Montrave Gay Lass" . . .	10 0 0
2. R. Sinclair Scott, Craigievar, Skelmorlie, "Scottish Rose" . . .	6 0 0
3. David Cross of Ingliston, Bishopton, "Sunshine" . . .	3 0 0
4. Edward Balfour, yr. of Balbirnie, Markinch, "Lady Dunmore" . . .	2 0 0
V. H. C.—W. H. Lumsden of Balmedie, Aberdeenshire, "Lady Sybil." H. C.—The Marquis of Londonderry, Seaham Hall, Seaham Har- bour. C.—Patrick Stirling of Kippendavie, Kippenross Home Farm, Dunblane, "Sunray."	

SECTION 8. FILLY, foaled on or after 1st January 1888.

1. R. Sinclair Scott, Craigievar, Skelmorlie, "Scottish Snowdrop" . . .	10 0 0
2. Earl Cawdor, Stackpole Court, Pembroke, South Wales, "Decreto" . . .	6 0 0
3. Lord Polwarth, Mertoun House, St Boswells, "Conny Nairn" . . .	3 0 0
4. Trustees of the late R. F. F. Campbell, Craigie House, Ayr, "Prin- cess Ariel" . . .	2 0 0
V. H. C.—James F. Murdoch, East Hallside, Newton, "My Aggie." H. C.—John Gilmour of Montrave, Leven, "Maggie the 5th." C.— Patrick Stirling of Kippendavie, Kippenross Home Farm, Dunblane, "Brenda of Kippendavie."	

SECTION 9. FILLY, foaled on or after 1st January 1889.

1. John Gilmour of Montrave, Leven, "Montrave Maud" . . .	10 0 0
2. Robert Murdoch, West Hallside, Newton, Glasgow, "Duchess II. of Girvan" . . .	6 0 0
3. W. H. Lumsden of Balmedie, Aberdeenshire, "Balmedie Madaleine" . . .	3 0 0
4. Alexander Murdoch, Garteraig, Shettleston, "Princess Alice" . . .	2 0 0
V. H. C.—John Galbraith, Croy Cunningham, Killearn. H. C.— William Watson, Ochterlony Mains, Guthrie, Forfarshire, "Gipsy Maid." C.—Sir James Duke, Bart., Laughton, Sussex, "Laughton Jeannie."	

SECTION 10. YEARLINGS the produce of the Queen's Pre-
mium Stallions that have served in Scotland,
out of Mares of any breed. Given by Mr
Gilmour of Montrave, the Scotch Represen-
tative on the Royal Commission on Horse
Breeding.

1. William Tod, East Brackley, Kinross, Colt . . .	10 0 0
2. Walter Marshall, Lochmalony, Cupar, Fife, Gelding, "Major" . . .	7 0 0
3. J. D. Lumsden, Huntingtowerfield, Perth, Colt, "Royalist" . . .	5 0 0
4. James Bain, East Grange, St Andrews, Fife, Colt, "Abimelech" . . .	2 0 0
5. Thomas Walker, Demperton, Auchtermuchty, Gelding, "Regent" . . .	1 0 0

HUNTERS AND ROADSTERS.

SECTION 11. MARE or GELDING, suitable for Field, foaled
before 1st January 1887.

1. William Parkin Moore, Whitehall, Mealsgate, Carlisle, Gelding, "Postboy" . . .	12 0 0
2. W. W. Anderson, Kingston, North Berwick, Gelding, "Game Boy" . . .	8 0 0
3. W. E. Gilmour, Woodbank, Alexandria, N.B., Mare, "Pomona" . . .	4 0 0
C.—F. B. Sharp, Fern Hall, near Dundee, Gelding, "Mars."	

SECTION 12. MARE or GELDING, suitable for Field, foaled
on or after 1st January 1887.

1. W. E. Gilmour, Woodbank, Alexandria, Mare, "Minnie" . . .	12 0 0
2. Donald T. Martin, Girgenti, Irvine, Mare, "Una" . . .	8 0 0
3. Captain Clayhills Henderson, R.N., Invergowrie, Dundee, Mare, "May" . . .	4 0 0
C.—Captain Clayhills Henderson, R.N., Invergowrie, Dundee, Mare, "Beatrice."	

Carry forward . . . £406 14 0

Brought forward . . . £405 14 0

SECTION 13. MARE or GELDING, suitable for Field, foaled on or after 1st January 1888.

- | | | | |
|---|----|---|---|
| 1. James Bain, East Grange, St Andrews, Gelding, "Tommy" . . . | 10 | 0 | 0 |
| 2. James Bain, East Grange, St Andrews, Mare, "Mary Graham" . . . | 5 | 0 | 0 |
| 3. George Pople, Newhouse, Perth, Gelding, "Prince" . . . | 3 | 0 | 0 |
| C.—J. Harriott Bell, Belmont, Dundee, Mare, "Duchess of Rossie." | | | |

SECTION 14. MARE or GELDING, suitable as Hackney, to be exhibited in Saddle only.

- | | | | |
|--|---|---|---|
| 1. William Parkin Moore, Whitehall, Mealsgate, Carlisle, Gelding, "The Baby" . . . | 8 | 0 | 0 |
| 2. James Hepburn, Forth Bank, Kinghorn, Mare, "Lady Mary" . . . | 4 | 0 | 0 |
| 3. Charles L. Bruce, Burnside, Fochabers, Mare, "Merry Duchess" . . . | 2 | 0 | 0 |

SECTION 15. MARE or GELDING, suitable for Driving, 3 years old and upwards, to be shown in Harness and Driven.

- | | | | |
|--|---|---|---|
| 1. R. H. Walker of Hartwood, West Calder, Mare, "Lady Madge" . . . | 8 | 0 | 0 |
| 2. Andrew Hunter, Braehead House, Cathcart, Mare, "Coquette" . . . | 4 | 0 | 0 |
| 3. Francis Collier, Brae Cottage, Broughty Ferry, Mare, "Lady Frances" . . . | 2 | 0 | 0 |
| C.—John Robertson, 3 Clarendon Terrace, Dundee, Gelding, "Marquis." | | | |

SECTION 16. HORSE or MARE for Jumping.

- | | | | |
|---|----|---|---|
| 1. George C. Mount, South Balluderon, Dundee, Gelding, "Peter" . . . | 20 | 0 | 0 |
| 2. John M. Timperon, Kelsick, Wigton, Cumberland, Gelding, "Prince" . . . | 10 | 0 | 0 |
| 3. David Carnegie, East Pitcorthie, Colinsburgh, Gelding, "Altus" . . . | 5 | 0 | 0 |
| H. C.—Thomas Richmond, Hilton, Perth, Gelding, "Harlequin." | | | |

PONIES.

SECTION 17. STALLION, 15 Hands and under.

- | | | | |
|---|---|---|---|
| 1. R. H. Walker of Hartwood, West Calder, "Merry Sunshine" (1523) . . . | 6 | 0 | 0 |
| 2. James Douglas Fletcher of Rosehaugh, Inverness, "The Baron" (1984) . . . | 3 | 0 | 0 |
| 3. J. & E. W. Bell, Belmont, Dundee, "Rossie Tom" . . . | 1 | 0 | 0 |
| C.—J. & E. W. Bell, Belmont, Dundee, "Jeremiah." | | | |

SECTION 18. MARE or GELDING, between 13 and 14½ hands.

- | | | | |
|---|---|---|---|
| 1. James Douglas Fletcher of Rosehaugh, Inverness, Mare, "Madeline" . . . | 6 | 0 | 0 |
| 2. John Service, Regent Street, Greenock, Mare, "Lady Regent" . . . | 3 | 0 | 0 |
| 3. E. T. Blackburn Stratton, Kinloch House, St Andrews, Gelding, "Black Prince" . . . | 1 | 0 | 0 |
| C.—William Maitland Malcolm, Auchnacraig House, Isle of Mull, Mare, "Queenie." | | | |

SECTION 19. MARE or GELDING, between 12 and 13 hands.

- | | | | |
|---|---|---|---|
| 1. R. H. Walker of Hartwood, West Calder, Mare, "Olivette" . . . | 6 | 0 | 0 |
| 2. J. Harriott Bell, Belmont, Dundee, Gelding, "The Masher" . . . | 3 | 0 | 0 |
| 3. J. D. Lumsden, Huntingtowerfield, Perth, Mare, "Gipsy Queen" . . . | 1 | 0 | 0 |
| C.—A. F. Durkie, Mill of Mains, Dundee, Gelding, "Jacob." | | | |

SECTION 20. MARE or GELDING, under 12 hands.

- | | | | |
|---|---|---|---|
| 1. A. Rennie, 18 Wellmeadow Street, Paisley, Mare, "Victoria" . . . | 6 | 0 | 0 |
| 2. Alexander C. Houston, Wester Walkinshaw, Paisley, Mare, "Little Tottie" . . . | 3 | 0 | 0 |
| 3. William D. Dudgeon, Easter Ballindean, Inchtute, Mare, "Flora Macdonald" . . . | 1 | 0 | 0 |
| C.—Thomas Bell, Hazelwood, Broughty Ferry, Gelding, "Tommy." | | | |

SECTION 21. SHETLAND STALLION, not exceeding 10½ hands.

- | | | | |
|--|---|---|---|
| 1. The Marquis of Londonderry, Seaham Hall, Seaham Harbour, "Thor" . . . | 4 | 0 | 0 |
| 2. Mrs Cheape, Wellfield, Strathmiglo, "The Marquis" . . . | 2 | 0 | 0 |
| 3. Gavin Hadden, Dalmuinzie, Murtle, Aberdeen, "Multum in Parvo" . . . | 1 | 0 | 0 |
| C.—W. Campbell, 2 Hermitage Terrace, Broughty Ferry, "Magnus." | | | |

Carry forward . . . £533 14 0

Brought forward . . . £533 14 0

SECTION 22. SHETLAND MARE or GELDING, not exceeding 10½ hands.

1. The Marquis of Londonderry, Seaham Hall, Seaham Harbour, Mare, "Vesta"	4 0 0
2. Mrs Cheape, Wellfield, Strathmiglo, Mare, "Dron" (with foal at foot)	2 0 0
3. Mrs Cheape, Wellfield, Strathmiglo, Mare, "The Marchioness"	1 0 0
H. C.—Mrs Cheape, Wellfield, Strathmiglo, Gelding, "The General."	

SECTION 23. PONIES, 14 hands and under, for Jumping.

1. John Y. Carnegie, East Pitcorthie, Colinsburgh, Gelding, "Saltator"	5 0 0
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EXTRA HORSES.

Highly Commended.

John Sharp & Sons, Dundee, Draught Gelding, "Clyde"	
Minor Gold Medal	3 6 0

Commended.

Robert Kilgour, Ardlin, Ellon, Thoroughbred Stallion, "Casique"	
Silver Medal	0 14 0
R. H. Walker of Hartwood, West Calder, Roadster Stallion, "Duke of Norfolk" (1931)	
Silver Medal	0 14 0
F. N. Menzies, Balmacneil, Ballinluig, Highland Stallion, "Legag"	
Silver Medal	0 14 0
David Mitchell, Millfield, Polmont, Pony Stallion, "Mars" (1234)	
Silver Medal	0 14 0
D. L. Thompson, 134 Nethergate, Dundee, Arabian Mare and Foal, "Countess"	
Silver Medal	0 14 0
James Shepherd, Rossend Castle, Burntisland, American Trotting Mare, "Wyoming"	
Silver Medal	0 14 0
	£553 4 0

CLASS III.—SHEEP.

BLACKFACED.

SECTION 1. TUP above 1 Shear.

1. John Archibald, Overshiels, Stow	£12 0 0
2. John Archibald, Overshiels, Stow	8 0 0
3. Alexander Clark, Todlaw, Lesmahagow	4 0 0
V. H. C.—John Archibald, Overshiels, Stow. H. C.—Donald T. Martin of Girgenti, Irvine. C.—Charles Howatson of Glenbuck, Glenbuck.	

SECTION 2. SHEARLING TUP.

1. John Archibald, Overshiels, Stow	12 0 0
2. John Archibald, Overshiels, Stow	8 0 0
3. John Archibald, Overshiels, Stow	4 0 0
V. H. C.—R. & J. Cadzow, Borland, Biggar. H. C.—Charles Howatson of Glenbuck, Glenbuck. C.—The Duke of Argyll, K.G., Ballymenach, Campbeltown.	

SECTION 3. Three EWES, above 1 Shear, with their Lambs at foot.

1. Donald T. Martin of Girgenti, Irvine	10 0 0
2. John Craig, Innergeldie, Comrie	5 0 0
3. James A. Gordon of Arabella, Nigg Station	2 0 0
V. H. C.—R. & J. Cadzow, Borland, Biggar. H. C.—John Craig, Innergeldie, Comrie.	

Carry forward . . . £65 0 0

Brought forward . . . £65 0 0

SECTION 4. Three SHEARLING EWES or GIMMERS.

1. The Duke of Argyll, K.G., Ballymenach, Campbeltown . . .	10 0 0
2. The Duke of Argyll, K.G., Ballymenach, Campbeltown . . .	5 0 0
3. R. & J. Cadzow, Borland, Biggar . . .	2 0 0
V. H. C.—D. T. Martin of Girgenti, Irvine. H. C.—R. Sinclair Scott, Flatt Farm, Largs. C.—William Whyte, Spott, Kirriemuir.	

CHEVIOT.

SECTION 5. TUP, above 1 Shear.

1. John A. Johnstone, Archbank, Moffat	12 0 0
2. John Robson, Newton, Bellingham	8 0 0
3. John Robson, Newton, Bellingham	4 0 0
V. H. C.—Jacob Robson, Byrness, Otterburn.	

SECTION 6. SHEARLING TUP.

1. John Robson, Newton, Bellingham	12 0 0
2. John Robson, Newton, Bellingham	8 0 0
3. John A. Johnstone, Archbank, Moffat	4 0 0
V. H. C.—Elliot & Smith, Mowhaugh, Yetholm, Kelso.	

SECTION 7. Three EWES, above 1 Shear, with their Lambs at foot.

1. John Robson, Newton, Bellingham	10 0 0
2. Jacob Robson, Byrness, Otterburn	5 0 0
3. Jacob Robson, Byrness, Otterburn	2 0 0

SECTION 8. Three SHEARLING EWES or GIMMERS.

1. John Robson, Newton, Bellingham	10 0 0
2. John Robson, Newton, Bellingham	5 0 0
3. Jacob Robson, Byrness, Otterburn	2 0 0

BORDER LEICESTER.

TWEEDDALE GOLD MEDAL. *Best Border Leicester Tup in the Yard.*

Executors of late R. Fender, Northfield, Coldingham	18 5 8
---	--------

SECTION 9. TUP, above 1 Shear.

1. Executors of late R. Fender, Northfield, Coldingham	12 0 0
2. William Ford, Fenton Barns, Drem	8 0 0
3. Executors of late R. Fender, Northfield, Coldingham	4 0 0
H. C.—Thomas Clark, Oldhamstocks Mains, Cockburnspath. C.— Samuel Jack, Crichton Mains, Dalkeith.	

SECTION 10. SHEARLING TUP.

1. Thomas Clark, Oldhamstocks Mains, Cockburnspath	12 0 0
2. The Duke of Buccleuch and Queensberry, K.T., Dalkeith Park, Dalkeith	8 0 0
3. William Ford, Fenton Barns, Drem	4 0 0
V. H. C.—Right Hon. Arthur J. Balfour of Whittinghame, M.P., Pres- tonkirk. H. C.—Executors of the late R. Fender, Northfield, Coldingham. C.—Trustees of the Earl of Dalhousie, Pannure, Carnoustie.	

SECTION 11. Three EWES, above 1 Shear.

1. Executors of the late R. Fender, Northfield, Coldingham	10 0 0
2. Executors of the late R. Fender, Northfield, Coldingham	5 0 0
3. Right Hon. Arthur J. Balfour of Whittinghame, M.P., Prestonkirk	2 0 0
H. C.—George Robeson, Springwells, Coldstream.	

Carry forward . . . £247 5 8

Brought forward . . . £247 5 8

SECTION 12. Three SHEARLING EWES or GIMMERS.

1. Thomas Clark, Oldhamstocks Mains, Cockburnspath	10	0	0
2. Right Hon. Arthur J. Balfour of Whittinghame, M.P., Prestonkirk	5	0	0
3. George Robeson, Springwells, Coldstream	2	0	0
V. H. C.—Trustees of the Earl of Dalhousie, Panmure, Carnoustie. H. C.—Executors of the late R. Fender, Northfield, Coldingham. C.—W. S. Ferguson, Pictstonhill, Perth.			

SHROPSHIRE.

SECTION 13. TUP, above 1 Shear.

1. David Buttar, Corston, Coupar-Angus	12	0	0
2. David Buttar, Corston, Coupar-Angus	8	0	0
3. David Buttar, Corston, Coupar-Angus	4	0	0
H. C.—H. A. F. Lindsay Carnegie of Kinblethmont, Arbroath.			

SECTION 14. SHEARLING TUP.

1. David Buttar, Corston, Coupar-Angus	12	0	0
2. David Buttar, Corston, Coupar-Angus	8	0	0
3. David Buttar, Corston, Coupar-Angus	4	0	0
V. H. C.—David Buttar, Corston, Coupar-Angus. H. C.—David Buttar, Corston, Coupar-Angus. David Buttar, Corston, Coupar-Angus. C.—Andrew Crawford, Tayhill, Perth.			

SECTION 15. Three EWES, above 1 Shear.

1. David Buttar, Corston, Coupar-Angus	10	0	0
2. David Buttar, Corston, Coupar-Angus	5	0	0
3. H. A. F. Lindsay Carnegie of Kinblethmont, Arbroath	2	0	0
H. C.—A. J. S. Johnstone of Halleaths, Broadholm, Lockerbie.			

SECTION 16. Three SHEARLING EWES or GIMMERS.

1. The Earl of Mansfield, K.T., Scone Palace, Perth	10	0	0
2. David Buttar, Corston, Coupar-Angus	5	0	0
3. David Buttar, Corston, Coupar-Angus	2	0	0
V. H. C.—John Wallace, Duniface, Leven. H. C.—George P. Davidson, Banchory, Kirkcaldy. John Wallace, Duniface, Leven. C.—James T. Cathcart, yr. of Pitcairlic, Auchtermuchty.			

OXFORD DOWN.

SECTION 17. TUP, above 1 Shear.

1. Frederic Street, Somersham Park, St Ives, Hunts	5	0	0
2. John C. Toppin, Musgrave Hall, Skelton, Penrith	3	0	0
C.—Right Hon. Arthur James Balfour of Whittinghame, M.P., Prestonkirk.			

SECTION 18. SHEARLING TUP.

1. John C. Toppin, Musgrave Hall, Penrith	5	0	0
2. Frederic Street, Somersham Park, St Ives, Hunts	3	0	0
H. C.—Right Hon. Arthur James Balfour of Whittinghame, M.P., Prestonkirk.			

SECTION 19. Three EWES, above 1 Shear.

1. John C. Toppin, Musgrave Hall, Skelton, Penrith	5	0	0
2. Right Hon. Arthur J. Balfour of Whittinghame, M.P., Prestonkirk	3	0	0

SECTION 20. Three SHEARLING EWES or GIMMERS.

1. Frederic Street, Somersham Park, St Ives, Hunts	5	0	0
2. John C. Toppin, Musgrave Hall, Skelton, Penrith	3	0	0
H. C.—Right Hon. Arthur James Balfour of Whittinghame, M.P., Prestonkirk.			

Carry forward . . . £378 5 8

Brought forward . . . £378 5 8

EXTRA SECTIONS.

SECTION 21. Three BLACKFACED WETHERS, 1 Shear.

1. James Weir, Sandilands, Lanark	4 0 0
2. William Tasker, East Camno, Meigle	2 0 0
3. James Weir, Sandilands, Lanark	1 0 0
V. H. C.—William Watt, Dura Mains, Cupar, Fife. H. C.—William Tasker, East Camno, Meigle. C.—William Tasker, East Camno, Meigle.	

SECTION 22. Three CHEVIOT WETHERS, 1 Shear.

1. William Tod, Pardovan, Philipstoun	4 0 0
2. William Tod, Pardovan, Philipstoun	2 0 0
3. William Tod, Pardovan, Philipstoun	1 0 0

SECTION 23. Three CROSS-BRED WETHERS, 1 Shear.

1. David Hume, Barrelwell, Brechin	4 0 0
2. William Tasker, East Camno, Meigle	2 0 0
3. F. W. Christie, Dairsie Mains, Cupar, Fife	1 0 0
V. H. C.—John Gilmour of Montrave, Leven, Fife. H. C.—David Hume, Barrelwell, Brechin. C.—William Watt, Dura Mains, Cupar, Fife.	

EXTRA SHEEP.

Very Highly Commended.

John Gilmour of Montrave, 3 Cross Wethers	Minor Gold Medal	3 6 0
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Highly Commended.

William Tasker, East Camno, Meigle, 3 Cross Gimmers	Silver Medal	0 14 0
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Commended.

Lady William Osborne Elphinstone, Tullyallan, Kincardine-on-Forth, black four-horned Hebridean Tup	Medium Silver Medal	0 9 3
Lady William Osborne Elphinstone, Tullyallan, Kincardine-on-Forth, black four-horned Hebridean 2 Ewes and 2 Lambs	Medium Silver Medal	0 9 3
Alexander Anderson, Berryhill, Dundee, Dorset-horned Ewes	Medium Silver Medal	0 9 3

 £404 13 5

CLASS IV.—SWINE.

LARGE WHITE BREED.

SECTION 1. BOAR.

1. The Earl of Haddington, Tynninghame, Prestonkirk	£5 0 0
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SECTION 2. SOW.

1. Somner Logan, Harrietfield, Kelso	4 0 0
2. The Earl of Haddington, Tynninghame, Prestonkirk	2 0 0

SECTION 3. Three PIGS, not above 8 Months old.

1. Somner Logan, Harrietfield, Kelso	4 0 0
2. Somner Logan, Harrietfield, Kelso	2 0 0
3. W. Campbell, 191 Perth Road, Dundee	1 0 0

WHITE BREED OTHER THAN LARGE.

SECTION 4. BOAR.

1. <i>No Award.</i>	
2. W. Campbell, 191 Perth Road, Dundee	3 0 0
Carry forward	£21 0 0

Brought forward . . . £21 0 0

SECTION 5. SOW.

- | | |
|---|-------|
| 1. W. Campbell, 191 Perth Road, Dundee | 4 0 0 |
| 2. The Earl of Mansfield, K.T., Scone Palace, Perth | 2 0 0 |

SECTION 6. Three PIGS, not above 8 Months old.
No Award.

BLACK OR BERKSHIRE BREED.

SECTION 7. BOAR.

- | | |
|---|-------|
| 1. W. Campbell, 191 Perth Road, Dundee | 5 0 0 |
| 2. John Keith, Nether Balgay, Dundee | 3 0 0 |
| 3. Captain Clayhills Henderson of Invergowrie, R.N., Dundee | 1 0 0 |

SECTION 8. SOW.

- | | |
|---|-------|
| 1. W. Campbell, 191 Perth Road, Dundee | 4 0 0 |
| 2. Henry Richley, Market Place, Corbridge-on Tyne | 2 0 0 |
| 3. Captain Clayhills Henderson of Invergowrie, R.N., Dundee | 1 0 0 |
| V. H. C.—Captain Clayhills Henderson of Invergowrie, R.N., Dundee. | |
| H. C.—Henry Richley, Market Place, Corbridge-on-Tyne. C.— | |
| John Keith, Nether Balgay, Dundee. | |

SECTION 9. Three PIGS, not above 8 Months old.

- | | |
|---|-------|
| 1. W. Campbell, 191 Perth Road, Dundee | 4 0 0 |
| 2. Henry Richley, Market Place, Corbridge-on-Tyne | 2 0 0 |
| 3. Henry Richley, Market Place, Corbridge-on-Tyne | 1 0 0 |

£50 0 0

CLASS V.—POULTRY.

SECTION.

- | | |
|---|--------|
| 1. DORKING, Silver Grey. Cock— | |
| 1. James Cranston, Tinwald House, Dumfries | £1 0 0 |
| 2. Bisset & Laing, Auchtermuchty | 0 10 0 |
| 2. DORKING, Silver Grey. Hen— | |
| 1. James Clunas, 74 High Street, Elgin | 1 0 0 |
| 2. James Cranston, Tinwald House, Dumfries | 0 10 0 |
| 3. DORKING, Silver Grey. Cockerel— | |
| 1. James Clunas, 74 High Street, Elgin | 1 0 0 |
| 2. William Hall, Keir Cottage, Dunblane | 0 10 0 |
| 4. DORKING, Silver Grey. Pullet— | |
| 1. James Robertson, Home Farm, Gordon Castle, Fochabers | 1 0 0 |
| 2. William Hall, Keir Cottage, Dunblane | 0 10 0 |
| 5. DORKING, Coloured. Cock— | |
| 1. James Cranston, Tinwald House, Dumfries | 1 0 0 |
| 6. DORKING, Coloured. Hen— | |
| 1. James Cranston, Tinwald House, Dumfries | 1 0 0 |
| 2. Andrew Crichton, Glamis | 0 10 0 |
| 7. DORKING, Coloured. Cockerel— | |
| 1. James Cranston, Tinwald House, Dumfries | 1 0 0 |
| 2. William Adam, Tynet Lodge, Port-Gordon | 0 10 0 |
| 8. DORKING, Coloured. Pullet— | |
| 1. William Adam, Tynet Lodge, Port-Gordon | 1 0 0 |
| 2. James Cranston, Tinwald House, Dumfries | 0 10 0 |
| 9. COCHIN-CHINA. Cock— | |
| 1. Miller & Ferguson, Reform Street, Dunfermline | 1 0 0 |
| 10. COCHIN-CHINA. Hen— | |
| 1. David Marr, Schoolhouse, Maryton, Montrose | 1 0 0 |
| 2. Mrs Nicoll, 150 Scouringburn, Dundee | 0 10 0 |

Carry forward . . . £14 0 0

	Brought forward	£14 0 0
11. COCHIN-CHINA. Cockerel.		
1. Tom Sowerby, Cleethorpes, Grimsby, Lincolnshire	1 0 0	
12. COCHIN-CHINA. Pullet—		
1. Tom Sowerby, Cleethorpes, Grimsby, Lincolnshire	1 0 0	
13. BRAHMAPOOTRA. Cock—		
1. A. Douglas Farmer, Kinkell, St Andrews	1 0 0	
2. Mrs James Lorimer, 33 High Street, Dundee	0 10 0	
14. BRAHMAPOOTRA. Hen—		
1. William Brown, Westfield, Dunfermline	1 0 0	
2. John Gillies, Edington Mills, Chirnside	0 10 0	
15. BRAHMAPOOTRA. Cockerel—		
1. John Gillies, Edington Mills, Chirnside	1 0 0	
2. E. Bird, Ramornie, Kington, Herefordshire	0 10 0	
16. BRAHMAPOOTRA. Pullet—		
1. James A. Ferguson, Glamis	1 0 0	
2. E. Bird, Ramornie, Kington, Herefordshire	0 10 0	
17. SPANISH. Cock—		
1. George Bruce, 27 Strathmartine Road, Dundee	1 0 0	
18. SPANISH. Hen— <i>No Entry.</i>		
19. SPANISH. Cockerel.— <i>No Entry.</i>		
20. SPANISH. Pullet.— <i>No Entry.</i>		
21. SCOTCH GREY. Cock—		
1. W. S. Mitchell, Castle Orchards, Airth, Larbert	1 0 0	
2. David Hastings, Irvine Bank Cottage, Darvel, Ayrshire	0 10 0	
22. SCOTCH GREY. Hen—		
1. W. G. M'Dougall, George Street, Stirling	1 0 0	
2. David P. Scott, Lorne Bank, Monifieth	0 10 0	
23. SCOTCH GREY. Cockerel—		
1. A. W. Henderson, Airthrey Mills, Bridge of Allan	1 0 0	
2. Thomas Miller, South Lodge, Auchtyfardle, Lesmahagow	0 10 0	
24. SCOTCH GREY. Pullet—		
1. W. S. Mitchell, Castle Orchards, Airth, Larbert	1 0 0	
2. A. W. Henderson, Airthrey Mills, Bridge of Allan	0 10 0	
25. HAMBURG. Cock—		
1. Ferguson & Sinclair, Parkneuk, Dunfermline	1 0 0	
2. Mrs W. S. Robertson, Struan Bank, Wormit, Newport, Fife	0 10 0	
26. HAMBURG. Hen—		
1. Mrs W. S. Robertson, Struan Bank, Wormit, Newport, Fife	1 0 0	
2. John Dryburgh, Cowdenbeath	0 10 0	
27. HAMBURG. Cockerel—		
1. Robert Wood, Panmure, Carnoustie	1 0 0	
2. Robert Wood, Panmure, Carnoustie	0 10 0	
28. HAMBURG. Pullet—		
1. Robert Wood, Panmure, Carnoustie	1 0 0	
2. Arthur Thomson, 28 Parkneuk, Dunfermline	0 10 0	
29. Any other Pure Breed. Cock—		
1. James Scott, Fort Hill Cottage, Maryfield Road, Broughty Ferry (Minorca)	1 0 0	
2. David Hastings, Irvine Bank Cottage, Darvel, Ayrshire (Creve Cœur)	0 10 0	
30. Any other Pure Breed. Hen—		
1. Rev. Fitzroy Lloyd, The Priory, Pittenweem (Plymouth Rock)	1 0 0	
2. David Hastings, Irvine Bank Cottage, Darvel, Ayrshire (Creve Cœur)	0 10 0	
Carry forward	£38 0 0	

		Brought forward	£38 0 0
31.	Any other Pure Breed. Cockerel—		
	1. Rev. Fitzroy Lloyd, The Priory, Pittenweem (Plymouth Rock)	1 0 0	
	2. Mrs Kinnaid, Clockmill, Duns (Minorca)	0 10 0	
32.	Any other Pure Breed. Pullet—		
	1. R. F. Dudgeon, The Grange, Kirkcudbright (Plymouth Rock)	1 0 0	
	2. David Marr, Schoolhouse, Maryton, Montrose (Golden Poland)	0 10 0	
33.	GAME—Black or Brown Reds. Cock—		
	1. J. & C. Sneddon, Beechbank, Ratho, Mid-Lothian	1 0 0	
	2. Thomas Scott, South Woodend, Bonnybridge	0 10 0	
34.	GAME—Black or Brown Reds. Hen—		
	1. R. G. Smith, Georgeville, Mid-Calder	1 0 0	
	2. J. & C. Sneddon, Beechbank, Ratho, Mid-Lothian	0 10 0	
35.	GAME—Black or Brown Reds. Cockerel—		
	1. J. & C. Sneddon, Beechbank, Ratho, Mid-Lothian	1 0 0	
36.	GAME—Black or Brown Reds. Pullet—		
	1. J. & C. Sneddon, Beechbank, Ratho, Mid-Lothian	1 0 0	
37.	GAME—Any other Pure Breed. Cock—		
	1. David Traill, Dundee Bleach Works, Dundee (Pile)	1 0 0	
	2. Thomas Scott, South Woodend, Bonnybridge (Pile)	0 10 0	
38.	GAME—Any other Pure Breed. Hen—		
	1. James Graham, Dundee Bleach Works, Dundee (Pile)	1 0 0	
	2. J. & C. Sneddon, Beechbank, Ratho, Mid-Lothian (Duckwing)	0 10 0	
39.	GAME—Any other Pure Breed. Cockerel—		
	1. J. & C. Sneddon, Beechbank, Ratho, Mid-Lothian (Duckwing)	1 0 0	
	2. John Ellis, Waterhead, Eddleston (Pile)	0 10 0	
40.	GAME—Any other Pure Breed. Pullet—		
	1. J. & C. Sneddon, Beechbank, Ratho, Mid-Lothian (Duckwing)	1 0 0	
	2. John Ellis, Waterhead, Eddleston (Pile)	0 10 0	
41.	BANTAM—Any Pure Breed. Cock—		
	1. Mrs Frew, The Barony, Cupar, Fife	1 0 0	
	2. J. & C. Sneddon, Beechbank, Ratho, Mid-Lothian (Game)	0 10 0	
42.	BANTAM—Any Pure Breed. Hen—		
	1. J. & C. Sneddon, Beechbank, Ratho, Mid-Lothian (Game)	1 0 0	
	2. Miss Bessie P. Frew, The Barony, Cupar, Fife	0 10 0	
43.	BANTAM—Any Pure Breed. Cockerel—		
	1. James Duncan, 7 Bell Place, Forfar (Black Red)	1 0 0	
	2. J. & C. Sneddon, Beechbank, Ratho, Mid-Lothian (Game)	0 10 0	
44.	BANTAM—Any Pure Breed. Pullet—		
	1. J. & C. Sneddon, Beechbank, Ratho, Mid-Lothian (Game)	1 0 0	
	2. Miss Robina Frew, The Barony, Cupar, Fife	0 10 0	
45.	DUCKS—White Aylesbury. Drake—		
	1. R. G. Smith, Georgeville, Mid-Calder	1 0 0	
	2. R. G. Smith, Georgeville, Mid-Calder	0 10 0	
46.	DUCKS—White Aylesbury. Duck—		
	1. R. G. Smith, Georgeville, Mid-Calder	1 0 0	
	2. R. G. Smith, Georgeville, Mid-Calder	0 10 0	
47.	DUCKS—White Aylesbury. Drake (Young)—		
	2. R. F. Dudgeon, The Grange, Kirkcudbright	1 0 0	
	2. R. G. Smith, Georgeville, Mid-Calder	0 10 0	
48.	DUCKS—White Aylesbury. Duckling—		
	1. R. F. Dudgeon, The Grange, Kirkcudbright	1 0 0	
	2. R. G. Smith, Georgeville, Mid-Calder	0 10 0	
		Carry forward	£64 0 0

		Brought forward	£64 0 0
49.	DUCKS—Rouen. Drake—		
	1. R. G. Smith, Georgeville, Mid-Calder	1 0 0	
	2. Frederic Street, Somersham Park, St Ives, Hunts	0 10 0	
50.	DUCKS—Rouen. Duck—		
	1. R. G. Smith, Georgeville, Mid-Calder	1 0 0	
	2. R. G. Smith, Georgeville, Mid-Calder	0 10 0	
51.	DUCKS—Rouen. Drake (Young)—		
	1. Frederic Street, Somersham Park, St Ives, Hunts	1 0 0	
	2. John Gillies, Edington Mills, Chirnside	0 10 0	
52.	DUCKS—Rouen. Duckling—		
	1. John Shields, Auctioneer, Linlithgow	1 0 0	
	2. Frederic Street, Somersham Park, St Ives, Hunts	0 10 0	
53.	DUCKS—Any other Pure Breed. Drake—		
	1. R. G. Smith, Georgeville, Mid-Calder (Pekin)	1 0 0	
	2. Thomas Scott, South Woodend, Bonnybridge (Pekin)	0 10 0	
54.	DUCKS—Any other Pure Breed. Duck—		
	1. R. G. Smith, Georgeville, Mid-Calder (Pekin)	1 0 0	
	2. Thomas Scott, South Woodend, Bonnybridge (Pekin)	0 10 0	
55.	DUCKS—Any other Pure Breed. Drake (Young)—		
	1. R. G. Smith, Georgeville, Mid-Calder (Pekin)	1 0 0	
	2. George Reid, Ladywell, Kirriemuir (Pekin)	0 10 0	
56.	DUCKS—Any other Pure Breed. Duckling—		
	1. George L. Oliver, Whithaugh, Newcastleton (Pekin)	1 0 0	
	2. R. G. Smith, Georgeville, Mid-Calder (Pekin)	0 10 0	
57.	TURKEYS—Any Pure Breed. Cock—		
	1. John M. Martin of Auchendennan, Balloch (Cambridge-shire Bronze)	1 0 0	
	2. Miss Watson, Inchyra, Glencarse, Perth (American Bronze)	0 10 0	
58.	TURKEYS—Any Pure Breed. Hen—		
	1. Robert Clark, Taybank, Errol (Bronze)	1 0 0	
	2. John M. Martin of Auchendennan, Balloch (Cambridge-shire Bronze)	0 10 0	
59.	TURKEYS—Any Pure Breed. Cock (Poult)—		
	1. Abram Kerr, Castlehill, Thornhill (Bronze)	1 0 0	
	2. H. A. F. Lindsay Carnegie, of Kinblethmont, Arbroath	0 10 0	
60.	TURKEYS—Any Pure Breed. Hen (Poult)—		
	1. Abram Kerr, Castlehill, Thornhill (Bronze)	1 0 0	
	2. David L. Picken, Milton, Kirkeudbright	0 10 0	
61.	GEESE—Any Pure Breed. Gander—		
	1. David L. Picken, Milton, Kirkeudbright (Toulouse)	1 0 0	
	2. R. G. Smith, Georgeville, Mid-Calder (Toulouse)	0 10 0	
62.	GEESE—Any Pure Breed. Goose—		
	1. David L. Picken, Milton, Kirkeudbright (Toulouse)	1 0 0	
	2. R. G. Smith, Georgeville, Mid-Calder (Toulouse)	0 10 0	
63.	GEESE—Any Pure Breed. Gander (Young)—		
	1. R. G. Smith, Georgeville, Mid-Calder (Toulouse)	1 0 0	
	2. H. A. F. Lindsay Carnegie, of Kinblethmont, Arbroath (Toulouse)	0 10 0	
64.	GEESE—Any Pure Breed. Gosling—		
	1. R. G. Smith, Georgeville, Mid-Calder (Toulouse)	1 0 0	
	2. David L. Picken, Milton, Kirkeudbright (Toulouse)	0 10 0	
			£88 0 0

CLASS VI.—DAIRY PRODUCE.

SECTION.

1. CURED BUTTER, not less than 28 lb.—

1. William Whyte, Nether Mill Dairy, Bishopton . . .	£5 0 0
2. George Morton, Kirktonmoor, Eaglesham . . .	4 0 0
3. David Longwill, Kendieshill, Linlithgow . . .	3 0 0
V. H. C.—Alexander Fleming, Threepland, Eaglesham. H. C.	
—Henry Orr, Torrance, Armadale, West Lothian. C.—	
Robert Gilmour, Stonebyres, Eaglesham.	

2. POWDERED BUTTER, not less than 7 lb.—

1. William Whyte, Nether Mill Dairy, Bishopton . . .	5 0 0
2. Archibald Bulloch, Miliken, Maryhill . . .	4 0 0
3. Robert Gilmour, Stonebyres, Eaglesham . . .	3 0 0
V. H. C.—George Morton, Kirktonmoor, Eaglesham. H. C.	
—Col. John Murray, Polmaise Castle, Stirling. C.—Mrs	
Archibald Cullen, Woodend Farm, Airdrie.	

3. FRESH BUTTER, Three 1-lb. Rolls—

1. Henry Orr, Torrance, Armadale, West Lothian . . .	5 0 0
2. Alexander Fleming, Threepland, Eaglesham . . .	4 0 0
3. Robert Gilmour, Stonebyres, Eaglesham . . .	3 0 0
V. H. C.—Col. John Murray, Polmaise Castle, Stirling. H.	
C.—George Morton, Kirktonmoor, Eaglesham. C.—	
David Longwill, Kendieshill, Linlithgow.	

4. Two SWEET-MILK CHEESES, not less than 30 lb., made according to any method—

1. Robert Montgomerie, Lessnessock, Ochiltree . . .	10 0 0
2. W. H. Ralston, Culmore, Stranraer . . .	5 0 0
3. George Kennedy, Aird Dairy, Stranraer . . .	3 0 0
V. H. C.—James Cochrane, Torrs, Kirkcudbright. H. C.—	
William Devlin, Boreland, Balmaghie, Castle-Douglas.	
C.—William M'Master, jr., Cruggleton, Garlieston.	

£54 0 0

CLASS VII.—IMPLEMENTS.

GRIST MILLS.

1. Woodroffe & Co., Albion Iron Works, Rugeley . . .	£12 0 0
2. Barford & Perkins, Queen Street Iron Works, Peterborough . . .	7 0 0
3. Blackstone & Co., Rutland Engineering Works, Stamford . . .	6 0 0
	£25 0 0

CLASS VIII.—HIGHLAND INDUSTRIES AND FISHERIES.

SECTION.

1. Collection of KIPPERED and PRESERVED SALMON.—*No Competition.*2. Collection of PRESERVED and DRIED SEA-FISH.—*No Competition.*

3. Collection of HAND-KNITTED STOCKINGS and HOSE, hand spun, not less than 6 pairs—

1. Mrs John Mackenzie, Badachro, Gairloch . . .	£3 0 0
2. Kenina Urquhart, Opinan, Gairloch . . .	2 0 0
V. H. C.—Anne Mackenzie, Port Henderson, Gairloch. H.	
C.—Isabella Macdonald, Opinan, Gairloch.	

Carry forward . . . £5 0 0

	Brought forward .	£5	0	0
4.	Collection of HOME-MADE ARTICLES, made from Cheviot wool, hand spun and dyed, and hand-loom woven.— <i>No Competition.</i>			
5.	Collection of HOME-MADE ARTICLES, made from Blackfaced wool, hand spun and dyed, and hand-loom woven.— <i>No Competition.</i>			
6.	Collection of YARN of NATIVE WOOL, hand spun and home dyed, not less than 4 cuts—			
	1. Mrs Alex. Bain, Opinan, Gairloch	3	0	0
	2. P. & J. Haggart, Aberfeldy	2	0	0
	H. C.—Catherine Mackenzie, Opinan, Gairloch.			
7.	Collection of HARRIS EMBROIDERY.— <i>No Competition.</i>			
		£10	0	0

ABSTRACT OF PREMIUMS.

Cattle	£831	4	0
Horses	553	4	0
Sheep	404	13	5
Swine	50	0	0
Poultry	88	0	0
Dairy Produce	54	0	0
Implements	25	0	0
Highland Industries	10	0	0
	£2016	1	5

JUDGES.

SHORTHORN.—T. H. Hutchinson, The Manor House, Catterick, Yorkshire.

AYRSHIRE.—John Torrance, Deadwaters, Lesmahagow.

ABERDEEN-ANGUS.—William Robertson, Linkwood, Elgin; John Grant, Advie Mains, Advie, Strathspey; Robert Walker, Altyre, Forres.

GALLOWAY.—M. Clark, Culmain, Crockettford, Dumfries.

HIGHLAND.—Peter Robertson, Achilty, Strathpeffer, Ross-shire.

STALLIONS AND ENTIRE COLTS.—Walter S. Park, Hatton, Bishopton; James Durno, Jackstown, Rothienorman; Abram Kerr, Castlehill, Durrisdier.

MARES AND FILLIES.—William Taylor, Park Mains, Paisley; Thomas Kerr, Kirkchrist, Kirkcudbright; John Sleigh, Strichen Mains, Strichen.

HUNTERS, ROADSTERS, AND PONIES.—John M. Martin of Auchendennan, Alexandria, N.B.; Charles J. Cunningham, Wooden, Kelso; James Hope, East Barns, Dunbar.

BLACKFACED.—Robert Watson, Culterallers, Biggar.

CHEVIOT.—John Miller, Scrabster, Thurso.

BORDER LEICESTER.—Andrew Wood, Brocksbushes, Corbridge, Northumberland.

SHROPSHIRE AND OXFORD DOWN.—T. S. Minton, Montford, Shropshire.

SWINE.—Robert Wallace, Auchenbrain, Mauchline, Ayrshire.

POULTRY.—Enoch Hutton, Columbarian House, Pudsey, Yorkshire.

DAIRY PRODUCE.—Alex. Osborne, 45 Candleriggs Street, Glasgow.

IMPLEMENTS.—Jonathan Middleton, Clay of Allan, Fearn, Ross-shire; John Kerr, Broomhouse, Corstorphine.

HIGHLAND INDUSTRIES AND FISHERIES.—Mrs Athole MacGregor, Eastwood, Dunkeld; Miss Stewart Robertson, Edradynate, Ballinluig.

ATTENDING MEMBERS.

- SHORTHORN.**—George R. Glendinning, Hatton Mains; W. T. Farquhar, yr. of Pit-scandly; Andrew Hutcheson, Dundee.
- AYRSHIRE.**—Alexander Murdoch, Gartcraig; Lord Kinnaird, Rossie Priory; Robert J. Lyall, Powis.
- ABERDEEN-ANGUS.**—Duncan Forbes of Culloden; David Carswell of Rathillet; John Hay, Balleave.
- GALLOWAY.**—Donald Fisher, Jellyholm; H. A. F. Lindsay Carnegie of Boysack; William Crawford, Beechwood.
- HIGHLAND.**—Sir Robert Menzies of Menzies; E. G. Baxter of Teases; W. S. Ferguson, Pictstonhill.
- STALLIONS AND ENTIRE COLTS.**—Andrew Allan, Munnoch; Captain Clayhills Henderson of Invergowrie, R.N.; William Briggs Constable of Benarty.
- MARES, FILLIES, AND GELDINGS.**—John Ballingall, Dunbog; Councillor Willsher, Dundee; John Black, Cortachy.
- HUNTERS, ROADSTERS, AND PONIES.**—Alexander Maccluff of Bonhard; Colonel Rait, C.B., of Aniston; Robert Anderson, Middlebank.
- BLACKFACED.**—C. Macpherson Grant of Drumduan; C. M. Lingard Guthrie, yr. of Carnoustie; Thomas Smith, Mains of Fowlis.
- CHEVIOT.**—R. Shirra Gibb, Boon; Thomas Lawson of Carriston; John Shiell, Brechin.
- BORDER LEICESTER.**—W. J. Maxwell, yr. of Munches; James T. Cathcart, yr. of Pitcairle; John Ogilvy, Harecraig.
- SHROPSHIRE AND OXFORD DOWN.**—William Dingwall, Ramornie; H. S. Wedderburn of Birkhill; Provost Doig, Forfar.
- SWINE.**—Thomas D. Findlay of Easterhill; Aug. W. Cruikshank of Langley Park; James Chalmers, Shielhill.
- POULTRY.**—R. G. Wardlaw Ramsay of Whitehill; Bailie Craig, Dundee.
- DAIRY PRODUCE.**—G. Wilken, Waterside of Forbes; Colonel John Grant Kinloch.

III.—DISTRICT COMPETITIONS.

CATTLE, HORSES, AND SHEEP.

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
<i>Garioch</i>	A. M. Gordon of Newton	Shorthorn Bull . . .	£2 0 0
	A. M. Gordon of Newton	do.	1 0 0
	A. M. Gordon of Newton	Shorthorn Cow . . .	2 0 0
	John Law, New Keig	do.	1 0 0
	Captain Edward Fraser of } Williamston	Aberdeen-Angus Bull . . .	2 0 0
	Robert Maitland, Balhalgady	do.	1 0 0
	James Stephen, Conglass	Aberdeen-Angus Cow . . .	2 0 0
	Captain Edward Fraser of } Williamston	do.	1 0 0
<i>Dalbeattie</i>	Andrew Mitchell, Barcheskie	Aged Ayrshire Bull . . .	2 0 0
	William Boyd, Glenstocking	Two-year-old do. . . .	2 0 0
	Mark J. Stewart of South- } wick, M.P.	One-year-old do. . . .	2 0 0
	William Wilson, Netherlaw	Ayrshire Cow	2 0 0
Carry forward			£20 0 0

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
		Brought forward	£20 0 0
	Mark J. Stewart of Southwick, M.P.	Two-year-old Ayrshire Heifer	2 0 0
	Andrew Mitchell, Barcheskie		
		One-year-old do. . . .	2 0 0
<i>Deeside Union</i>	David Nicol, Upper Anguston	Two-year-old Shorthorn Bull	1 12 6
	A. W. Still, Nether Anguston	do. do.	1 7 6
	Duncan Davidson, Inchmarlo	do. do.	1 0 0
	Adam Todd, Nether Mills of Drum	do. Aberdeen-Angus Bull	1 12 6
	John Smith, Drumduan	do. do.	1 7 6
	John Ross, Milton	do. do.	1 0 0
	David Nicol, Upper Anguston	do. Shorthorn Heifer	1 12 6
	David Nicol, Upper Anguston	do. do.	1 7 6
	David Nicol, Upper Anguston	do. do.	1 0 0
<i>Turriff</i>	John Ledingham, Slap	Shorthorn Bull . . .	1 0 0
	Wm. Murray, Pittendreich	do. Cow . . .	1 0 0
	Wm. Murray, Pittendreich	do. Heifer . . .	1 0 0
	Wm. Murray, Pittendreich	do. Cow and two of her Progeny . . .	1 0 0
	G. A. Duff of Hatton	Aberdeen-Angus Bull . . .	1 0 0
	A. Simpson, Kirkside	do. Cow . . .	1 0 0
	A. Simpson, Kirkside	do. Heifer . . .	1 0 0
	A. Simpson, Kirkside	do. Cow and two of her Progeny . . .	1 0 0
	George Cocker, Hill of Petty	Draught Mare . . .	1 0 0
	Geo. Bean, Balquhain Mains	Three-year-old Filly . . .	1 0 0
	Geo. Bean, Balquhain Mains	Mare with Foal at foot . . .	1 0 0
	Geo. Bean, Balquhain Mains	Mare and two of her Progeny . . .	1 0 0
<i>Biggar</i>	James Hamilton, Woolfords	Ayrshire Cow . . .	3 0 0
	John Noble, Skirling Farm	do. . . .	2 0 0
	W. M'Gillivray, Westfield	do. . . .	1 0 0
	Thomas Scott, Netherhall	One-year-old Ayrshire Bull . . .	3 0 0
	John Fraser, Little Gala	do. do. . . .	2 0 0
	John Inch, Howburn	do. do. . . .	1 0 0
<i>Breadalbane</i>	Trustees of John Willison, Glenlochay	•Blackfaced Aged Tup . . .	1 10 0
	Trustees of John Willison, Glenlochay		
	Thomas Watters, Glenample	do. do. . . .	0 10 0
	Angus Fletcher, Auchtertyre	do. Shearling Tup . . .	1 10 0
	Thomas Watters, Glenample	do. do. . . .	1 0 0
	John Fisher, Auchrioch	do. do. . . .	0 10 0
	Trustees of John Willison, Glenlochay	Blackfaced Ewes . . .	1 10 0
	Marquis of Breadalbane	do. do. . . .	1 0 0
	Trustees of John Willison, Glenlochay	do. do. . . .	0 10 0
	Trustees of John Willison, Glenlochay	do. Gimmers . . .	1 10 0
	Trustees of John Willison, Glenlochay	do. do. . . .	1 0 0
	Marquis of Breadalbane	do. do. . . .	0 10 0
<i>Wester Ross</i>	J. D. Fletcher of Rosehaugh	Brood Mare . . .	2 0 0
	Lady Ross of Balnagown	Shorthorn Heifer . . .	2 0 0
	J. D. Fletcher of Rosehaugh	Aberdeen-Angus Bull . . .	2 0 0
	M. & E. Macrae, Kinbeachie	Highland Heifer . . .	2 0 0
	M. & E. Macrae, Kinbeachie	Leicester Tup . . .	1 0 0
	W. Mundell, Moy	Cheviot Tup . . .	1 0 0
	Colin Macrae, Dochcarty	Cheviot Ewe . . .	1 0 0
	Jas. A. Gordon, Arabella	Blackfaced Ewe . . .	1 0 0
Carry forward			£34 0 0

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
		Brought forward	£84 0 0
<i>Eastern District of Strathlingshire</i>	John Provan, Drum of Kinnaird	Shorthorn Bull . . .	3 0 0
	W. T. Malcolm, Dunmore	do. Cow . . .	3 0 0
	Donald Mitchell of Millfield	Brood Mare . . .	3 0 0
	William Paterson of Barnego	Entire Colt . . .	3 0 0
<i>Gargunnoch</i>	M. C. Stark, Westerton	Ayrshire Cow	Minor Silver Medal
	James Sands, Greenfoot	do. Bull	Minor Silver Medal
	R. C. M'Farlane, West Carse	Brood Mare	Minor Silver Medal
<i>Sutherland</i>	E. M. Sutherland, Pulrossie	Draught Mare	Minor Silver Medal
	Duke of Sutherland, K.G.	Aberdeen-Angus Bull	Minor Silver Medal
	J. B. Dudgeon, Crakaig	Cheviot Tup	Minor Silver Medal
<i>Stranraer and Rhins of Galloway</i>	Wm. Murray, Burrowmoss	Ayrshire Cow	Minor Silver Medal
	James Wither, Lagganmore	Ayrshire Bull	Minor Silver Medal
	Mathew Marshall, Stranraer	Clydesdale Mare	Minor Silver Medal
<i>Lockerbie</i>	A. Montgomery, Netherhall	Stallion . . .	15 0 0
<i>Western District of Mid-Lothian</i>	Wm. Renwick, Meadowfield	Stallion . . .	15 0 0
<i>Dalbeattie</i>	Wm. Montgomery, Banks	Stallion . . .	15 0 0
<i>Royal Northern</i>	Captain E. Fraser of Williamston	Aged Aberdeen-Angus Bull .	3 0 0
	James Reid, Greystone	do. do.	2 0 0
	William Adam, Bush	do. do.	1 0 0
	William M'Combie of Easter Skene	Two-year-old do.	3 0 0
	G. A. Duff of Hutton	do. do.	2 0 0
	Marquis of Huntly	do. do.	1 0 0
	James Reid, Greystone	Aberdeen-Angus Heifer	3 0 0
	Her Majesty The Queen	do.	2 0 0
	Her Majesty The Queen	do.	1 0 0
<i>Strathbogie</i>	D. C. Bruce, Broadland	Two-year-old Shorthorn Bull	3 0 0
	Repres. of the late Mrs Wanes, The Ward	do. do.	2 0 0
	James Leith, Glengerrack Mains	do. do.	1 0 0
	Alex. Simpson, Kirkside	Aberdeen-Angus Heifer	3 0 0
	William Wilson, Coynachie	do.	2 0 0
	James Davidson, Newton Cairnie	do.	1 0 0
<i>United Banffshire</i>	D. C. Bruce, Broadland	Aged Shorthorn Bull . .	1 10 0*
	A. Murray, Old Manse	do. . .	1 0 0*
	Repres. of A. Longmore, Rettie	do. . .	0 10 0*
	A. Simpson, Kirkside	Polled Bull, 2 years and under	3 0 0
	G. A. Duff of Hutton	do. do.	2 0 0
	George Smith, Hungryhills	do. do.	1 0 0
	J. Leith, Glengerrack Mains	Shorthorn Heifer . . .	3 0 0
	J. Leith, Glengerrack Mains	do. . .	2 0 0
	R. Turner, Cairnton	do. . .	1 0 0
Carry forward			£186 0 0

* Half Premiums awarded, the number of lots being under five.

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
		Brought forward	£186 0 0
<i>Inverness</i>	Earl Cawdor	Two-year-old Colt . . .	1 0 0*
	C. Lyon Mackenzie of Braelangwell }	do.	0 10 0*
	James Mackessack, Earnside	Two-year-old Filly . . .	2 0 0
	T. R. Biscoe of Newton	do.	1 0 0
	H. R. MacRae of Clunes	do.	0 10 0
	John Cran, Kirkton	One-year-old Filly . . .	2 0 0
	C. Lyon Mackenzie of Braelangwell }	do.	1 0 0
	The Mackintosh of Mackintosh }	do.	0 10 0
<i>Kinross-shire</i>	David Ferguson, Burleigh	Two-year-old Colt . . .	2 0 0
	Robt. D. Thom, Pitlochrie	do.	1 0 0
	Andrew Greig of Holeton	One-year-old Colt . . .	1 0 0*
	John Paton, Kirkness	do.	0 10 0*
	John Sheoch, Coldon	Two-year-old Filly . . .	2 0 0
	William Young, Lathro	do.	1 0 0
	Andrew Greig of Holeton	do.	0 10 0
	David Ferguson, Burleigh	One-year-old Filly . . .	2 0 0
	John Paton, Kirkness	do.	1 0 0
	David Fotheringham, Hilton	do.	0 10 0
<i>Dumbarton-shire</i>	Robert Muirhead, Hawthornhill }	Two-year-old Colt . . .	2 0 0
	Mrs Mather, Highdykes	do.	1 0 0
	Alex. M'Lachlan, Gartconnel	One-year-old Colt . . .	2 0 0
	Duncan Fraser, Auchentoshan }	do.	1 0 0
	Robert Renwick, Dalmuir	Two-year-old Filly . . .	2 0 0
	Arch. Bulloch, Milliken	do.	1 0 0
	Jn. Bauchop, Park Cottage	do.	0 10 0
	Jn. Macdonald, Boquhanran	One-year-old Filly . . .	2 0 0
	Robert Renwick, Dalmuir	do.	1 0 0
	Andrew Renwick, Gairbraid	do.	0 10 0
<i>Lower District of Wigtown-shire</i>	Jas. A. Wallace, Clay Crop	Two-year-old Colt . . .	2 0 0
	Andrew Donnan, Shaddock	do.	1 0 0
	Wm. Hunter, Causewayend	One-year-old Colt . . .	2 0 0
	Matthew Kerr, Craiglemine	do.	1 0 0
	Jas. A. Wallace, Clay Crop	Two-year-old Filly . . .	2 0 0
	A. B. Matthews, Newton Stewart }	do.	1 0 0
	R. J. Craig, Egerness	do.	0 10 0
	Earl of Galloway	One-year-old Filly . . .	2 0 0
<i>Arran</i>	Wm. Campbell, Barwinnock	do.	1 0 0
	Messrs Hamilton, Penkiln	do.	0 10 0
	James Allan, jun., Balnacole }	Blackfaced Aged Tup . . .	1 0 0*
	James Allan, jun., Balnacole }	do.	0 10 0*
	James Allan, jun., Balnacole }	Blackfaced Shearling Tup . . .	1 0 0
	James Allan, jun., Balnacole }	Blackfaced Ewes . . .	2 0 0
	William Todd, Glenree	do.	1 0 0
	James Allan, jun., Balnacole }	Blackfaced Gimmers . . .	2 0 0
	William Todd, Glenree	do.	1 0 0
			£240 10 0
9 Minor Silver Medals			2 6 6
			<u>£242 16 6</u>

* Half Premiums awarded, the number of lots being under five.

SPECIAL GRANTS.

<i>Ayrshire Agricultural Association</i>	{ Vote to Dairy Produce Show at } £20 0 0
	{ Kilmarnock
<i>Orkney Agricultural Society</i>	Vote in aid of Premiums . . 3 0 0
<i>Rousay Agricultural Society</i>	do. do. . . 3 0 0
<i>South Uist and Barra</i>	do. do. . . 3 0 0
<i>North Uist</i>	do. do. . . 3 0 0
	£32 0 0

MEDALS IN AID OF PREMIUMS GIVEN BY LOCAL SOCIETIES.

Minor Silver Medals were awarded to the following:—

ABERDEENSHIRE.

NAME OF DIST.	SILVER MEDAL AWARDED TO	FOR
<i>Auchindoir, Kil- drumny, and Towie</i>	{ James Dawson, Old Town James Walker, Westside of Brux	Draught Mare Aberdeen-Angus Cow
<i>Cromar, Upper Dee and Donside Fyvie</i>	Robert Anderson, Wester Coull Marquis of Huntly, Aboyne Castle James Mackie, Lewes of Fyvie	Aberdeen-Angus Bull Aberdeen-Angus Cow Aberdeen-Angus Cow
<i>Kennethmont</i>	Geo. and John Cocker, Hill of Petty Robert Milne, Mains of Druminnor	Draught Mare Aberdeen-Angus Bull
<i>Mar</i>	John A. Cooper, Dunnydeer G. Hamilton of Skene House	Draught Mare Aberdeen-Angus Bull
<i>Slains</i>	R. Cowie, Newlands Alex. Sim, Clochton	Shorthorn Bull Shorthorn Bull
	Alex. Sim, Clochton	Clydesdale Gelding

ARGYLESHIRE.

<i>Islay, Jura, and Colonsay</i>	Robert Barr, Gartbreck	Ayrshire Cow
<i>Kintyre</i>	Arch. Gillespie, Craighens	Clydesdale Mare
	William Maxwell, Baraskomil	Blackfaced Tup
	Robert Cunningham, Kilkivan	Sweet-milk Cheese
<i>Mull and Morven</i>	Robert Stewart of Kinlochmoidart	Highland Bull
	T. V. Smith of Ardtornish	Highland Heifer
<i>South of Mull</i>	Wm. Maitland Malcolm, Auchnacraig	Draught Filly Foal
	Lachlan M'Innes, Aros Mains	Draught Filly Foal

AYRSHIRE.

<i>Ardrossan</i>	Andrew Allan, Munnoch	Ayrshire Heifer
	James Greig, Goldenberry	Clydesdale Entire Colt
<i>Carmunnock</i>	James Fleming, Muirside	Ayrshire Cow
	William Ballantine, Busbyside	Ayrshire Bull
<i>Carrick</i>	Robert Paton, Trees	Ayrshire Bull
	Robert Paton, Trees	Ayrshire Cow
<i>Colmonell and Ballantrae</i>	James Brisbane, Polcardoch	Ayrshire Cow
	R. & D. Wright, Downan	Clydesdale Filly
	John Scott, Dochroyle	Blackfaced Tup
<i>Coylton and Stair</i>	Arch. M'Cartney, Wraithill	Ayrshire Cow
	Andrew Logan, Overton	Clydesdale Mare
<i>Craigie</i>	William Hunter, Foulton	Ayrshire Cow
	Robert Templeton, Midton	Clydesdale Mare
<i>Cumnock</i>	James Murray, Muir	Ayrshire Cow
	Andrew L. Allan, Bankend	Brood Mare
<i>Dalrymple</i>	James Blair, Holmes	Ayrshire Cow
	James Armstrong, Thornhill	Clydesdale Stallion
<i>Darvel</i>	Gavin Alston, Yondercroft	Sweet-milk Cheese
	John Steel, Newtown	Powdered Butter
	Alex. Lawson, Darvel	Collection of Roots
	Matthew Mair, Auchinbart	Collection of Flowers
<i>Galston, Loudoun, and Lanfane</i>	George Alston, Loudounhill	Ayrshire Cow
	George Alston, Loudounhill	Clydesdale Mare

NAME OF DIST.	SILVER MEDAL AWARDED TO	FOR
<i>Monkton, Newton, Prestwick, &c. West Kilbride</i>	Jas. A. Reid, Mid-Sanquhar Trustees of late R. F. F. Campbell James Caldwell, Blackshaw Mrs Arthur, Carlung	Ayrshire Cow Clydesdale Filly Ayrshire Cow Clydesdale Mare
BERWICKSHIRE.		
<i>Lauderdale</i>	Robert Shirra Bruce, Thirlestane David Alston, Crosslee	Cattle Clydesdale Filly
DUMBARTONSHIRE.		
<i>Cumbernauld</i>	John Dykes, Old Inns Arch. Buchanan, Mainhead Thomas Chalmers, Walton	Ayrshire Cow Ayrshire Bull Clydesdale Filly
DUMFRIESSHIRE.		
<i>Moffat and Upper Annandale</i>	John Mackie, Sarkshields James Paton, Glencaple	Ayrshire Heifer Blackfaced Shearling Tup
FIFESHIRE.		
<i>Auchtermuchty</i>	James Thom of Leden Urquhart Malcolm Guild, Balcanquhal	Border Leicester Tup Border Leicester Ewes
<i>Cupar and North of Fife Western District of Fife</i>	James Thom, Leden Urquhart John Gilmour of Montrave R. Hoyer Miller of Blair Castle David Wilkie, Linbank	Border Leicester Tup Brood Mare Aberdeen-Angus Bull Clydesdale Filly
INVERNESS-SHIRE.		
<i>Northern Counties</i>	George Smith Grant, Auchorachan James Brander, Pittendreich	Fat Polled Heifer Fat Sheep
<i>Strathglass</i>	Dun. Robertson, Comar Lord Tweedmonth, Guisachan	Sand Oats Turnips
LANARKSHIRE.		
<i>Abington</i>	James Paton, Glencaple Robt. R. Haddow, Castle of Crawford	Blackfaced Tup Lamb Cheviot Tup Lamb
ORKNEY.		
<i>Rousay</i>	General Burroughs, C.B., of Rousay William Learmonth, Faraclett	Shorthorn Heifer Clydesdale Filly
PERTHSHIRE.		
<i>Mid. Dist. of Athole and Tullynet</i>	{ James Borrie, Mains of Kilmorich John M'Donald, Countlich	Green Crop Green Crop
<i>Moulin</i>		Green Crop
<i>Strathern Central</i>	Alex. Caddel, Coilvoulin J. E. Hume, Rossie	Blackfaced Ewes
<i>Weem</i>	Colonel Stirling of Kippendavie Alex. Robertson, Ballechin Robt. Menzies, Tirinie	Clydesdale Filly Shorthorn Bull Pen of Leicester Sheep
RENFREWSHIRE.		
<i>Renfrewshire</i>	William Mather of Netherplace James Stewart of Carrot	Ayrshire Cow Blackfaced Tup
STIRLINGSHIRE.		
<i>Falkirk</i>	William Sword of Bonnyview	Observatory

78 Minor Silver Medals, £20, 3s.

PLOUGHING COMPETITIONS.

In 1889-90 the Society's Silver Medal was awarded at 162 Ploughing Competitions.

162 Minor Silver Medals, £41, 17s.

IV.—COTTAGES AND GARDENS.

Money Premiums	£4 10 0
25 Minor Silver Medals	6 9 2
Total	<u>£10 19 2</u>

V.—VETERINARY DEPARTMENT.

CLASS EXAMINATIONS—1890.

ROYAL (DICK) VETERINARY COLLEGE.

Wm. M. Pye	Physiology	Alex. Paterson	Vet. Med. & Surgery
T. G. Heatley	Chemistry	Arthur Breakell	Cattle Pathology
W. P. Weston	Materia Medica	P. L. Smith	Junior Anatomy
Alex. Paterson	Practical Pathology	Geo. M. Sturgess	Botany
Wm. M. Pye	Senior Anatomy		

NEW VETERINARY COLLEGE, EDINBURGH.

Charles Ward	Horse Pathology	C. Haywood	Senior Anatomy
W. Kendall	Cattle, &c., Pathology	O. C. Bradley	Senior Anatomy
Charles Ward	Morbid Anatomy	O. C. Bradley	Botany
C. Haywood	Physiology	O. C. Bradley	Chemistry

GLASGOW VETERINARY COLLEGE.

William Logan	Horse Pathology	James Furniss	Junior Anatomy
W. H. Davidson	Cattle Pathology	George Irvine	Chemistry
J. A. Gilruth	Anatomy	Wm. Dawson	Botany
J. A. Gilruth	{ Histology and	Alex. M'Nairn	Botany
	{ Physiology		

25 Large Silver Medals, £17, 10s.

VI.—AGRICULTURAL CLASS, EDINBURGH UNIVERSITY.

E. A. Fulton, Sedgwick, Kendal	£2 0 0
J. S. Gordon, Stragollen, Strabane	2 0 0
R. J. Irving, Blackhall House, Carlisle	2 0 0
H. Wend Joyce, Blackfordly, Burton-on-Trent	2 0 0
A. B. Stevens, Mains of Kilgraston, Bridge of Earn	2 0 0
	<u>£10 0 0</u>

ABSTRACT OF PREMIUMS.

1. ESSAYS AND REPORTS, ...	£44 0 0
2. DUNDEE SHOW, 1890, ...	2016 1 5
3. DISTRICT SHOWS:—	
Stock	£242 16 6
Special Grants	32 0 0
Local Societies—78 Medals	20 3 0
Ploughing Associations—162 Medals	41 17 0
	<u>336 16 6</u>
4. COTTAGES AND GARDENS—Money Premiums, £4, 10s. ; 25 Minor Silver Medals, £6, 9s. 2d.	10 19 2
5. VETERINARY DEPARTMENT—Medals to Students	17 10 0
6. AGRICULTURAL CLASS, EDINBURGH UNIVERSITY	10 0 0
	<u>£2435 7 1</u>

STATE OF THE FUNDS

OF

THE HIGHLAND AND AGRICULTURAL SOCIETY

OF SCOTLAND

At 30th NOVEMBER 1890.

I. BONDS—		
Heritable—£11,000 at 4½ per cent, £1,300 at 4 per cent,		
£4,000 at 3½ per cent, £500 at 3½ per cent,	£16,800	0 0
Debenture Bonds by Clyde Navigation Trustees at 4 per cent,	2,000	0 0
	£18,800	0 0
II. DEBENTURE STOCK—		
£3,000 North British Railway Company 4½ per cent, at £129, 2s. 6d.,	£3,873	15 0
£2,727 Caledonian Railway Company 4 per cent, at £125, 12s. 6d.,	3,425	15 9
£1,000 London and North-Western Railway Company 4 per cent, at £130,	1,300	0 0
	8,599	10 9
III. BANK STOCK—		
£6,407, 7s. 8d. Royal Bank of Scotland, at £220,	£14,096	4 10
£2,218, 16s. 5d. Bank of England, at £329,	7,298	5 6
£2,000, 0s. 0d. British Linen Company Bank, at £341,	6,820	0 0
£1,250, 0s. 0d. National Bank of Scotland, at £318, 10s.	3,981	5 0
£1,080, 0s. 0d. Commercial Bank of Scotland (equivalent to 54 shares of £100 each, £20 paid), at £59, 12s. 6d.,	3,219	15 0
£1,091, 13s. 4d. Bank of Scotland, at £306,	3,340	10 0
	£38,756	0 4
<u>£14,047, 17s. 5d.</u>		
<i>Note.</i> —The original cost of these Bank Stocks was £22,360, 19s. 6d., showing a profit, at present prices, of £16,395, 0s. 10d.		
IV. TEN SHARES (£500) OF THE BRITISH FISHERIES' SOCIETY,		
valued at	200	0 0
V. ARREARS OF MEMBERS' SUBSCRIPTIONS, considered recoverable,		
	47	12 6
	£66,403	3 7
<i>Deduct.</i> —BALANCE DUE TO ROYAL BANK ON ACCOUNT		
CURRENT, at 30th November 1890,	348	6 8
AMOUNT OF GENERAL FUNDS,	£66,054	16 11
VI. BUILDING FUND—		
1. Estimated value of Building, No. 3 George IV. Bridge,	£3,100	0 0
2. Sum lent on Heritable Bond, at 3½ per cent,	350	0 0
3. Deposit with Royal Bank of Scotland,	103	14 11
AMOUNT OF BUILDING FUND,	£3,553	14 11
VII. TWEEDDALE MEDAL FUND—		
Heritable Bond, at 3½ per cent,	£500	0 0
VIII. FURNITURE—		
Estimated Value of Furniture, Paintings, Books, &c.,	£1,000	0 0

W. S. WALKER, *Treasurer.*

JAS. AULDJO JAMIESON, *Chairman of Finance Committee.*

WM. HOME COOK, C.A., *Auditor.*

EDINBURGH, 7th January 1891.

ABSTRACT of the ACCOUNTS of the HIGHLAND and CHARGE.

1. DEPOSIT RECEIPT with Royal Bank of Scotland in name of Building Fund,		£89 3 8
2. ARREARS of Annual Subscriptions at 30th Nov. 1889,	£48 4 6	
Whereof due by Members who have now compounded for life, and are thereby extinguished,	£8 0 0	
Sums ordered to be struck off,	27 0 6	
	35 0 6	13 4 0
3. INTERESTS AND DIVIDENDS—		
(1) Interest on Heritable Bonds, less Income-tax,	£629 5 7	
(2) Interest on Debenture Bonds, Do.	78 0 0	
(3) Interest on Debenture Stock, Do.	269 13 4	
	£976 18 11	
Deduct. — Interest on Overdraft on Account Current with Royal Bank of Scotland for year to 30th November 1890,	7 0 6	
	£969 18 5	
(4) Dividends on Bank Stocks—		
£6,407, 7s. 8d. Royal Bank of Scotland,	£576 13 2	
2,218, 16s. 5d. Bank of England,	232 19 6	
2,000, 0s. 0d. British Linen Co. Bank,	280 0 0	
1,250, 0s. 0d. National Bank of Scotland,	187 10 0	
1,080, 0s. 0d. Commercial Bank of Scotland,	151 4 0	
1,091, 13s. 4d. Bank of Scotland,	131 0 0	
	£14,047, 17s. 5d.	1,559 6 8
		2,529 5 1
4. INCOME from Building Fund—		
Interest on Heritable Bond for £350, less tax,	£11 18 10	
Interest on Deposits with Royal Bank,	2 12 5	
		14 11 3
5. SUBSCRIPTIONS—		
Annual Subscriptions,	£776 12 6	
Life Members,	789 6 6	
		1,565 19 0
6. RECEIPTS in connection with former Shows,		6 0 0
7. TRANSACTIONS—Proceeds of Sales from Messrs Blackwood for year 1889,		12 7 6
8. BALANCE of Receipts from Dundee Show,		2,178 8 8
9. MISCELLANEOUS RECEIPTS,		5 7 0
10. BALANCE due to Royal Bank of Scotland on Account Current, as at 30th November 1890,		348 6 8

SUM OF CHARGE,

£8,762 12 10

AGRICULTURAL SOCIETY of SCOTLAND for the Year 1889-90.

DISCHARGE.

1. BALANCE due to Royal Bank of Scotland on Account Current at 30th November 1889,				£754	0	0
2. ESTABLISHMENT EXPENSES—						
Salary to Secretary,				£850	0	0
Salary to Clerk, £300; Second Clerk, £150,				450	0	0
Wages to Messenger,				72	0	0
Feu-duty, £28; Water Rates, £2, 3s. 4d.; Taxes, £35, 4s. 4d.,				65	7	8
Coals and Firewood, £10, 12s.; Gas, £3, 2s. 8d.; Insurance, £8, 14s. 8d.,				28	9	4
Repairs and Furnishings,				44	15	1
						1,510 12 1
3. FEE to Auditor of Accounts for year 1888-89,					50	0 0
4. FEE to Practical Engineer for year,					20	0 0
5. AGRICULTURAL EDUCATION—						
Grant to Professor of Agriculture, £150; Prizes to Class, £10; Bursaries, £20; Fees to Examiners, Expenses, and Luncheons, £43, 10s.,					223	10 0
6. CHEMICAL DEPARTMENT—						
Salary to Chemist, £200; Allowance for Expenses, £200,				£400	0	0
Experimental Station at Pumpherstoun—Superintendent's Allowance, £15, 15s.; Manures, £11, 19s. 4d.,					27	14 4
Manures for District Experiments,					36	13 8
Feeding Stuffs for Experiments,					58	2 3
Grants to Analytical Associations,					109	11 6
Printing,					10	16 9
						642 18 6
7. VETERINARY DEPARTMENT—Fee to Professor Williams, £26, 5s.; Medals to Students, £17, 10s.,					43	15 0
8. BOTANICAL DEPARTMENT—Fee to Botanist for year,					25	0 0
9. SPECIAL GRANTS—Vote to Dairy Department, £100; Vote to Glasgow and West of Scotland Technical College, £50,					150	0 0
10. SOCIETY'S TRANSACTIONS—Printing, £213, 2s. 9d.; Binding and Postage, £136, 18s. 6d.; Delivering Transactions, £2, 2s.					352	3 3
11. ESSAYS AND REPORTS,					133	12 0
12. ORDINARY Printing and Lithographing, £54, 13s. 4d.; Advertising, £19, 10s. 1d.; Stationery, Books, &c., £31, 13s.; Postage and Receipt Stamps, £65; Bank and Post-Office Charges and Telegrams, £11, 18s. 5d.,					182	14 10
13. SUBSCRIPTIONS to Public Societies—Scottish Meteorological Society, £20; Society for Prevention of Cruelty to Animals, £5,					25	0 0
14. MISCELLANEOUS EXPENSES—Sum voted to Thomas Duncan on entering his 50th year of service in the Society's Office, £105; Secretary's Expenses attending Meetings for Nomination of Directors, £23, 5s. 6d.; Reporting Board Meetings, £21; Luncheons to Directors, £9, 10s. 6d.; Addressing Circulars, £10; Mr Stirling of Kippendavie, Travelling Expenses attending Meeting in London in regard to Pleuro-Pneumonia, £7; Badges, £4, 5s. 6d.; Medal voted to Wm. Simpson for invention of apparatus for indicating Awards, £3, 6s.; Mr M'Queen of Crofts, Expenses attending Trial of Acidity-Testers at Kilmarnock, £2, 8s.; Storing Turnstiles, £5; Recutting Medal die, and Restriking Plough Medal, £2; Sundries, £2,					194	15 6
15. PREMIUMS—						
Melrose Show,				£160	10	0
Dundee Show,				1,839	1	5
				£1,999	11	5
District Competitions,			£228	9	2	
Cottages and Gardens,			17	15	8	
				246	4	10
						2,245 16 3
16. PAYMENTS in connection with former Shows,					8	7 6
17. CAPITAL Sum invested on Heritable Bond,				£11,000	0	0
Less—Amount of Bonds realised,				10,979	16	0
						20 4 0
18. ARREARS of Subscriptions struck off as irrecoverable,					33	16 6
19. ARREARS considered recoverable,					47	12 6
20. SUM on Deposit Receipt with Royal Bank of Scotland, of date 11th November 1890, in name of Building Fund,					103	14 11
						£8,762 12 10

SUM OF DISCHARGE, . . . £8,762 12 10

W. S. WALKER, *Treasurer.*

JAS. AULDJO JAMIESON, *Chairman of Finance Committee.*

WM. HOME COOK, C.A., *Auditor.*

VIEW OF THE INCOME AND EXPENDITURE

For the Year 1889-90.

INCOME.

1. ANNUAL SUBSCRIPTIONS AND ARREARS received, ...	£708	7	6
2. LIFE SUBSCRIPTIONS received, ...	789	6	6
	£1,497	14	0
3. INTERESTS AND DIVIDENDS received—			
Interests, ...	£969	18	5
Dividends, ...	1,559	6	8
		2,529	5 1
4. INCOME FROM BUILDING FUND, ...		14	11 3
5. RECEIPTS in connection with former Shows, ...		6	0 0
6. TRANSACTIONS—Proceeds of Sales from Messrs Blackwood, ...		12	7 6
7. BALANCE OF RECEIPTS from Dundee Show, ...		2,178	8 8
8. MISCELLANEOUS RECEIPTS, ...		5	7 0
SUM OF INCOME, ...	£6,243	13	6

EXPENDITURE.

1. ESTABLISHMENT—			
Salaries and Wages, ...	£1,372	0	0
Fen-duties, Taxes, Coals, Gas, Insurance, ...			
Repairs and Furnishings, ...	138	12	1
	£1,510	12	1
2. FEE TO AUDITOR for 1888-89, ...	50	0	0
3. FEE TO PRACTICAL ENGINEER, ...	20	0	0
4. AGRICULTURAL EDUCATION (including Bursaries and Fees to Examiners), ...	223	10	0
5. CHEMICAL DEPARTMENT, ...	642	18	6
6. VETERINARY DEPARTMENT, ...	43	15	0
7. BOTANICAL DEPARTMENT, ...	25	0	0
8. SPECIAL GRANTS, ...	150	0	0
9. TRANSACTIONS, ...	352	3	3
10. ESSAYS AND REPORTS, ...	133	12	0
11. ORDINARY Printing, Advertising, Stationery, Postages, and Bank Charges, ...	182	14	10
12. SUBSCRIPTIONS to Public Societies, ...	25	0	0
13. MISCELLANEOUS, ...	194	15	6
14. PREMIUMS—			
Melrose Show, ...	£160	10	0
Dundee Show, ...	1,839	1	5
District Competitions, ...	228	9	2
Cottages and Gardens, ...	17	15	8
		2,245	16 3
15. PAYMENTS in connection with former Shows, ...		3	7 6
SUM OF EXPENDITURE, ...		5,803	4 11
BALANCE OF RECEIPTS, ...		£440	8 7

W. S. WALKER, *Treasurer.*JAS. AULDJO JAMIESON, *Chairman of Finance Committee.*WM. HOME COOK, C.A., *Auditor.*

EDINBURGH, 7th January 1891.

ABSTRACT of the ACCOUNTS of the ARGYLE NAVAL FUND for 1889-90.

CHARGE.

1. FUNDS as at 30th November 1889—			
Debenture Stock of the North British Railway Company,	£1,200	0	0
Funded Debt of the Clyde Navigation Trustees, £3,000, purchased at	2,970	0	0
Stock of the Royal Bank of Scotland, £305, purchased at	671	0	0
Loan on Heritable Security at 4 per cent, ...	1,200	0	0
	<u>£6,041</u>	<u>0</u>	<u>0</u>
BALANCE in Royal Bank of Scotland at 30th November 1889—			
On Deposit Receipt, ...	£134	18	11
On Current Account, ...	292	2	0
	<u>427</u>	<u>0</u>	<u>11</u>
			£6,468 0 11
2. INCOME received—			
On £1,200 North British Railway Company Debenture Stock at 4½ per cent, £51, less tax £1, 5s. 6d., ...	£49	14	6
On £3,000 Funded Debt of the Clyde Navigation Trustees at 4 per cent, £120, less tax £3, ...	117	0	0
On £305 Royal Bank Stock, ...	27	9	0
On £1,200 lent on Heritable Security, at 4 per cent, £48, less tax £1, 4s., ...	46	16	0
	<u>£240</u>	<u>19</u>	<u>6</u>
On Balance in Bank—			
On Deposit Receipt, ...	£3	17	3
On Current Account, ...	1	15	10
	<u>5</u>	<u>13</u>	<u>1</u>
			246 12 7
SUM OF CHARGE, ...			
			£6,714 13 6

DISCHARGE.

1. ALLOWANCES to the five following Recipients—			
Godfrey George Webster, first year, ...	£40	0	0
Colin Mackenzie, second year, ...	40	0	0
C. W. Campbell Strickland, second year, ...	40	0	0
Edward A. Baird, sixth year, ...	40	0	0
G. P. W. Hope, eighth year, ...	40	0	0
	<u>£200</u>	<u>0</u>	<u>0</u>
2. FUNDS as at 30th November 1890—			
Debenture Stock of the North British Railway Company, ...	£1,200	0	0
Funded Debt of the Clyde Navigation Trustees, £3,000, purchased at	2,970	0	0
Stock of the Royal Bank of Scotland, £305, purchased at	671	0	0
Loan on Heritable Security, at 4 per cent, ...	1,200	0	0
	<u>£6,041</u>	<u>0</u>	<u>0</u>
Balance in Royal Bank of Scotland at 30th November 1890—			
On Deposit Receipt, ...	£138	16	2
On Current Account, ...	334	17	4
	<u>473</u>	<u>13</u>	<u>6</u>
			6,514 13 6
SUM OF DISCHARGE, ...			
			£6,714 13 6

W. S. WALKER, *Treasurer.*

JAS. AULDJO JAMIESON, *Chairman of Finance Committee.*

WM. HOME COOK, C.A., *Auditor.*

EDINBURGH, 7th January 1891.

ABSTRACT of ACCOUNTS of the DUNDEE SHOW, 1890.

CHARGE.

1. LOCAL SUBSCRIPTIONS—

Voluntary Assessment on Proprietors—

Fifeshire, ...	£300 0 0
Forfarshire, ...	300 0 0
Perthshire, ...	200 0 0
Contribution by City of Dundee, ...	200 0 0
Amount of Private Subscriptions, ...	200 0 0

£1200 0 0

2. AMOUNT COLLECTED DURING SHOW—

Drawn at Gates, ...	£2,410 10 0	
Drawn at Grand Stand, ...	194 7 0	
Catalogues and Awards sold, ...	227 2 9	
Drawn at Lavatory, ...	5 7 6	
		2,837 7 3
3. RENT OF STALLS, ...		1,372 3 6
4. RENT OF REFRESHMENT BOOTHS, ...		200 0 0
5. INCOME FROM TWEEDDALE MEDAL FUND, ...		18 5 8
6. SUBSCRIPTIONS IN AID OF PREMIUMS, ...		139 0 0
7. FINES FOR NON-EXHIBITION OF LIVE STOCK, ...		62 0 0
8. INTEREST FROM ROYAL BANK, ...		11 15 11

£5,840 12 4

EDINBURGH, 7th January 1891.

ABSTRACT of ACCOUNTS of the DUNDEE SHOW, 1890.

DISCHARGE.

1. SHOWYARD EXPENDITURE—			
Fitting up Showyard, ...	£2,039	0	0
Rosettes, Caps, Flags, Blue Tape, Bonnet Badges, Lamps, ...	28	5	3
Clerk of Works, ...	11	19	11
Indicator for Awards, ...	11	16	6
Railway Carriages and Cartages of Turnstiles, Catalogues, &c., ...	12	2	6
Gratuity to Fireman, ...	5	11	0
Telephone, ...	3	0	0
Repairing Turnstiles, ...	3	0	0
Gratuity to Foremen Workmen, ...	2	5	0
Miscellaneous, ...	2	8	3
	£2,119	8	5
2. FORAGE AND BEDDING FOR STOCK, ...	311	0	8
3. POLICE, ...	51	16	5
4. TRAVELLING EXPENSES of Judges, Stewards, Secretary, and Assistants (37 in all), ...	109	12	1
5. ALLOWANCE to 23 Judges in lieu of Hotel Accommodation, ...	92	0	0
6. HOTEL BILLS—			
28 Directors, 6 Stewards, Secretary, Auditor, and Veterinary Surgeon (including Sitting Rooms and gratuities to servants), ...	£139	0	0
Two Clerks at 21s. each allowance per day, ...	21	0	0
Extra Assistants and Attendants, ...	15	8	7
Luncheons in Committee Room for Judges, Attending Members, and Members of Committee, and Breakfasts for Stewards, Assistants, and others, ...	98	11	0
		273	19 7
7. BANQUET, ...		17	7 6
8. MUSIC in Showyard, ...		88	12 0
9. PRINTING and Lithographing, ...		148	15 0
10. ADVERTISING and Bill-posting, ...		94	10 5
11. VETERINARY INSPECTOR, ...		10	0 0
12. BEE EXHIBITION, ...		20	0 0
13. PRACTICAL ENGINEER—			
Fees, 7 days at £4, 4s. per day, ...	£29	8	0
Fares and Personal Expenses, ...	9	5	6
Plan of Showyard and Fittings, ...	7	7	0
		46	0 6
14. TRIAL OF GRIST MILLS—			
Practical Engineer—Fee for 7 days at £4, 4s. per day, ...	£29	8	0
Do., Personal and Travelling Expenses, ...	9	9	0
Hire of Engine and Gear for Trials, ...	27	15	6
Man Assisting, ...	4	9	0
Coal, Coke, and Miscellaneous, ...	1	7	3
		72	8 9
15. EXTRA CLERKS, Assistants, and Attendants at Turnstiles, Gates, &c., ...	163	16	2
16. POSTAGES, ...	40	14	0
17. MISCELLANEOUS OUTLAYS, ...	2	2	2
AMOUNT OF GENERAL EXPENSES, ...	£3,662	3	8
18. PREMIUMS drawn at 30th November 1890, ...	1,839	1	5
	£5,501	5	1
BALANCE OF RECEIPTS, ...	339	7	3
<i>Note.</i> —From the above Balance of			£839 7 3
There must be deducted the Premiums undrawn at 30th November 1890, amounting to			177 0 0
MAKING THE PROBABLE SURPLUS, ...			£162 7 3

£5,840 12 4

W. S. WALKER, *Treasurer.*
 JAS. AULDJO JAMIESON, *Chairman of Finance Committee.*
 WM. HOME COOK, C.A., *Auditor.*

APPENDIX (B).

PREMIUMS

OFFERED BY

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND IN 1891.

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GENERAL NOTICE.

THE HIGHLAND SOCIETY was instituted in the year 1784, and incorporated by Royal Charter in 1787. Its operation was at first limited to matters connected with the improvement of the Highlands of Scotland; but the supervision of certain departments, proper to that part of the country, having been subsequently committed to special Boards of Management, several of the earlier objects contemplated by the Society were abandoned, while the progress of agriculture led to the adoption of others of a more general character. The exertions of the Society were thus early extended to the whole of Scotland, and have, for the greater part of a century, been directed to the promotion of the science and practice of agriculture in all its branches.

In accordance with this more enlarged sphere of action, the original title of the Society was altered, under a Royal Charter, in 1834, to THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

The leading purposes of the Institution are set forth in the following pages, where it will be found that Premiums are offered for Reports on almost every subject connected with the cultivation of the soil; the rearing and feeding of stock; the management of the dairy; the improvement of agricultural machinery and implements; the growth of timber; the extension of cottage accommodation; the application of chemical science; and the dissemination of veterinary information.

Among the more important measures which have been effected by the Society are—

1. Agricultural Meetings and General Shows of Stock, Implements, &c., held in the principal towns of Scotland, at which exhibitors from all parts of the United Kingdom are allowed to compete.
2. A system of District Shows instituted for the purpose of improving the breeds of Stock most suitable for different parts of the country, and of aiding and directing the efforts of Local Agricultural Associations.
3. The encouragement of Agricultural Education, under powers conferred by a supplementary Royal Charter, granted in 1856, and authorising "THE COUNCIL of the HIGHLAND AND AGRICULTURAL SOCIETY ON EDUCATION" to grant Diplomas to Students of Agriculture; and by the establishment of Bursaries.
4. The appointment of a chemist for the purpose of promoting the application of science to agriculture, and to superintend local experiments. Also to subsidise, under certain conditions, Local Analytical Associations.
5. The advancement of the Veterinary Art, by conferring Certificates on Students who have passed through a prescribed curriculum, and who are found, by public examination, qualified to practise. Now terminated in accordance with arrangements with the Royal College of Veterinary Surgeons.
6. The establishment of a Botanical Department.
7. The establishment of a Dairy Department.
8. The appointment of a Board of Examiners, and the granting of First and Second Class Certificates in Forestry.
9. The annual publication of the 'Transactions,' which comprehend the Prize Reports, and reports of experiments, also an abstract of the business at Board and General Meetings, and other communications.
10. The management of a fund left by John, 5th Duke of Argyll (the original President of the Society) to assist young natives of the Highlands who enter Her Majesty's Navy.

CONSTITUTION AND MANAGEMENT.

THE general business of the HIGHLAND AND AGRICULTURAL SOCIETY is conducted under the sanction and control of a Royal Charter, which authorises the enactment of Bye-Laws. Business connected with Agricultural Education is conducted under the authority of a supplementary Royal Charter, also authorising the enactment of Bye-Laws.

The Office-Bearers consist of a President, Four Vice-Presidents, Thirty-two Ordinary and Twenty Extraordinary Directors, a Treasurer, an Honorary and an Acting Secretary, an Auditor, and other Officers.

The Directors meet on the first Wednesday of each month from November to June; seven being a quorum. The proceedings of the Directors are reported to General Meetings of the Society, held in January and in June or July.

With reference to motions at General Meetings, Bye-Law No. 10 provides—“That at General Meetings of the Society no motion or proposal (except of mere form or courtesy) shall be submitted or entertained for immediate decision unless notice thereof has been given a week previously to the Board of Directors, without prejudice, however, to the competency of making such motion or proposal to the effect of its being remitted to the Directors for consideration, and thereafter being disposed of at a future General Meeting.”

The Council on Education, under the Supplementary Charter, consists of Sixteen Members—Nine nominated by the Charter, and Seven elected by the Society. The Board of Examiners consists of Sixteen Members.

Candidates for admission to the Society must be proposed by a Member, and are elected at the half-yearly General Meetings in January and June or July, but it is not necessary that the proposer should attend the meeting. The ordinary subscription is £1, 3s. 6d. annually, which may be redeemed by one payment, varying, according to the number of previous annual payments, from £7, 1s. to £12, 12s. Proprietors farming the whole of their own lands, whose rental on the Valuation Roll does not exceed £500 per annum, and all Tenant-Farmers, Secretaries or Treasurers of Local Agricultural Associations, Factors resident on Estates, Land-Stewards, Foresters, Agricultural Implement Makers, and Veterinary Surgeons, none of them being also owners of land to an extent exceeding £500 per annum, are admitted on a subscription of 10s. annually, which may be redeemed by one payment, varying, according to the number of previous annual payments, from £3 to £5, 5s. Subscriptions payable on election, and afterwards annually in January. According to the Charter, a Member who homologates his election by paying his first subscription cannot retire until he has paid in annual subscriptions, or otherwise, an amount equivalent to a life composition—namely, £12, 12s. or £5, 5s. Members having candidates to propose are requested to state whether the candidate should be on the £1, 3s. 6d. or 10s. list.

Members of the Society receive the ‘Transactions’ free on application to the Secretary, and are entitled to consult the Chemist and Botanist at reduced rates—to apply for District Premiums—to report Ploughing Matches for the Medal—to free admission to the Showyard, and to exhibit Stock and Implements at reduced rates. Firms are not admitted as Members, but if one partner of a firm becomes a Member, the firm is allowed to exhibit at Members’ rates.

Orders, payable at the Royal Bank of Scotland, Edinburgh, are issued by the Directors, in name of the persons in whose favour Premiums have been awarded.

All communications must be addressed to “FLETCHER NORTON MENZIES, Esq., Secretary of the Highland and Agricultural Society of Scotland, No. 3 George IV. Bridge, Edinburgh.”

ESTABLISHMENT FOR 1891.

President.

HIS GRACE THE DUKE OF MONTROSE, Buchanan Castle, Drymen.

Vice-Presidents.

LORD BALFOUR OF BURLEIGH, Kennet, Alloa.
 WILLIAM FORBES of Callendar, Falkirk.
 The Hon. ROBERT BAILLIE HAMILTON of Langton, Duns.
 CAMPBELL MACPHERSON GRANT of Drumduan, Forbes.

Ordinary Directors.

JOHN LORNE STEWART of Coll, Oban.
 JAMES T. S. ELLIOT of Wolfelee, Hawick.
 DAVID BUCHANAN, Garscadden Mains, New Kilpatrick.
 ANDREW MACKENZIE, Dalmore, Alness.
 Sir JAMES H. GIBSON-CRAIG of Riccarton, Bart., Currie.
 JOHN MARR, Cairnbrogie, Old Meldrum.
 Rev. JOHN GILLESPIE, Mouswald Manse, Ruthwell, R.S.O.
 ALEXANDER MACDUFF of Bonhard, Perth.
 Sir JAMES R. G. MAITLAND of Barnton, Bart., Craigend, Stirling.
 J. H. TURNER, Portland Estate Office, Kilmarnock.
 JOHN BALLINGALL, Dunbog, Newburgh, Fife.
 WILLIAM FORD, Fentonbarns, Drem.
 W. H. LUMSDEN of Balmedie, Aberdeen.
 W. J. MAXWELL, yr. of Munches, Terraughtie, Dumfries.
 DUNCAN FORBES of Culloden, Inverness.
 R. SHIRRA GIBB, Boon, Lauder.
 THOMAS D. FINDLAY, Bonnington, Lanark.
 JOHN GILMOUR of Montrave, Leven, Fife.
 DONALD FISHER, Jellyholm, Alloa.
 R. G. WARDLAW RAMSAY of Whitehill, Rosewell.
 G. WILKEN, Waterside of Forbes, Alford, N.B.
 JAMES LOCKHART, Mains of Airies, Stranraer.
 JOHN CRAN, Kirkton, Bunchrew, Inverness.
 The Hon. THE MASTER of POLWARTH, Humbie House, Upper Keith.
 PATRICK STIRLING of Kippendavie, Dunblane.
 ROBERT ANDERSON of Lochdhu, Nairn.
 GEORGE R. GLENDINNING, Hatton Mains, Wilkieston.
 ALEXANDER M. GORDON of Newton, Inch, Aberdeenshire.
 JOHN M. AITKEN, Norwood, Lockerbie.
 W. S. FERGUSON, Pictstonhill, Perth.
 DAVID M'GIBBON, Ardnacraig, Campbeltown.
 WALTER ELLIOT, Hollybush, Galashiels.

Extraordinary Directors.

R. YELLOWLEES, Provost of Stirling.
 Sir CHARLES E. F. STIRLING of Glorat, Bart., Milton of Campsie.
 Colonel JOHN MURRAY of Polmaise, Polmaise Castle, Stirling.

Colonel H. DRUMMOND MORAY, yr. of Blairdrummond, Stirling.
 ARCHIBALD STIRLING of Keir, Dunblane.
 Colonel DAVID R. WILLIAMSON of Lawers, Crieff.
 JOHN M. MARTIN of Auchendennan, Alexandria, N.B.
 A. C. DOUGLAS of Mains, Milngavie.
 ANDREW MITCHELL, The Walk House, Alloa.
 JOHN CRAIG, Innergeldie, Comrie.
 Sir ROBERT MENZIES of Menzies, Bart., Farleyer, Aberfeldy.
 Sir ALLAN R. MACKENZIE of Glenmuick, Bart., Ballater.
 GEORGE J. WALKER, Portlethen, Aberdeen.
 JOHN KERR, Broomhouse, Corstorphine.
 THOMAS ELLIOT, Blackhaugh, Galashiels.
 JAMES M'QUEEN of Crofts, Dalbeattie.
 Captain D. G. CLAYHILLS HENDERSON of Invergowrie, R.N., Dundee.
 DAVID BUTTAR, Corston, Coupar-Angus.
 ALEXANDER MURDOCH, Gartcraig, Shettleston.
 CHAS. HOWATSON, House of Glenbuck, Glenbuck.

Office-Bearers.

Sir WILLIAM STUART WALKER, K.C.B., *Treasurer*.
 Sir G. GRAHAM MONTGOMERY of Stanhope, Bart., *Honorary Secretary*.
 FLETCHER NORTON MENZIES, *Secretary*.
 Rev. ARCHIBALD SCOTT, D.D., *Chaplain*.
 ANDREW P. AITKEN, D.Sc., *Chemist*.
 WILLIAM HOME COOK, C.A., *Auditor*.
 TODS, MURRAY, & JAMIESON, W.S., *Law Agents*.
 A. N. M'ALPINE, *Consulting Botanist*.
 JAMES D. PARK, *Practical Engineer*.
 THOMAS DUNCAN, *Recorder and Clerk*.
 JOHN MACDIARMID, *Second Clerk*.
 GOURLAY STEELL, R.S.A., *Animal Portrait Painter*.
 WILLIAM WILLIAMS, F.R.C.V.S., *Professor of Veterinary Surgery*.
 THOMAS WALLEY, M.R.C.V.S., *Professor of Cattle Pathology*.
 WILLIAM BLACKWOOD & SONS, *Printers and Publishers*.
 G. WATERSTON & SONS, *Stationers*.
 JAMES CRICHTON & CO., *Silversmiths and Medallists*.
 JOHN WATHERSTON & SONS, *Inspectors of Works*.
 WILLIAM SIMPSON, *Messenger*.

Chairmen of Committees.

- | | |
|---|--|
| 1. <i>Argyll Naval Fund,</i> | Lord ELPHINSTONE, Carberry Tower, Musselburgh. |
| 2. <i>Chemical and Botanical</i> | G. R. GLENDINNING, Hatton Mains, Wilkie-ston. |
| 3. <i>Dairy,</i> | JAMES M'QUEEN of Crofts, Dalbeattie. |
| 4. <i>District Shows, and Cottages and Gardens,</i> | W. H. LUMSDEN of Balmeddie, Aberdeen. |
| 5. <i>Finance, Hall and Chambers, and Law,</i> | JAMES AULDJO JAMIESON, W.S., 66 Queen Street, Edinburgh. |
| 6. <i>Forestry and Highland Industries,</i> | Sir ROBERT MENZIES, Bart., Farleyer, Aberfeldy. |
| 7. <i>General Shows,</i> | PATRICK STIRLING of Kippendavie, Dunblane. |
| 8. <i>Machinery,</i> | JONATHAN MIDDLETON, Clay of Allan, Fearn. |
| 9. <i>Publications, Ordnance Survey, and Reports of Meetings,</i> | Rev. JOHN GILLESPIE, Mouswald Manse, Ruthwell, R.S.O. |
| 10. <i>Veterinary,</i> | Sir JAMES H. GIBSON-CRAIG of Riccarton, Bart., Currie. |

General Meetings.—By the Charter the Society must hold two General Meetings each year, and, under ordinary circumstances, they are held on the third Wednesday of the months of January and June, at one o'clock, in the Society's Hall, 3 George IV. Bridge, for the election of Members and other business.

Meeting at Stirling.—By a resolution of the General Meeting on 15th January 1879, a General Meeting of Members is held in the Showyard on the occasion of the Annual Show. This year it will be held at Stirling, on Wednesday, 29th July, at 11.30 A.M.

General Show at Stirling—28th, 29th, 30th, and 31st July. —Entries close for Implements, 25th May—Stock, Poultry, and Dairy Produce, 22d June.

Directors' Meetings.—The Board of Directors meet on the first Wednesday of each month from November till June inclusive, at *one* P.M., and occasionally as business may require, on a requisition by three Directors to the Secretary, or on intimation by him.

Nomination of Directors.—Meetings of Members, for the purpose of nominating Directors to represent the Show Districts on the Board, will be held at the places and on the days after mentioned :—

1. Glasgow, North British Station Hotel, ... Wednesday, 5th Aug., at 1.
2. Perth, Salutation Hotel, ... Friday, 7th August, at 2.
3. Stirling, Golden Lion Hotel, ... Friday, 21st August, at 1.
4. Edinburgh, 3 George IV. Bridge, ... Wednesday, 26th Aug., at 2.
5. Aberdeen, Imperial Hotel, ... Friday, 28th Aug. at 12.
6. Dumfries, King's Arms Hotel, ... Wednesday, 2d Sept., at 1.
7. Inverness, Caledonian Hotel, ... Friday, 4th Sept., at 12.30.
8. Kelso, Secretary's Tent, Ram Sale Ground, ... Friday, 11th Sept., at 1.

The nomination of Proprietors or other Members paying the higher subscription must be made in the 1st, 2d, 4th, and 8th Districts ; and the nomination of Tenant-Farmers or other Members paying the lower subscription, in the 3d, 5th, 6th, and 7th Districts.

Committee Meetings.

Forestry and Highland Industries.—First Tuesday in November, at 12.30 noon.

Machinery.—First Tuesday in November, at 1.15 P.M.

General Shows.—First Tuesday in November, at 2 P.M.

Publications, Ordnance Survey, and Reports of Meetings.—First Wednesday in January, at 12 noon, and first Wednesday in November, at 12 noon.

District Shows, and Cottages and Gardens.—First Tuesday in December, at 12 noon.

Chemical and Botanical.—First Tuesday in March, and first Tuesday in December, at 2 P.M.

The other Standing Committees—ARGYLL NAVAL FUND ; FINANCE, HALL AND CHAMBERS, AND LAW ; DAIRY AND VETERINARY, meet when required.

Examinations for the Society's Diploma and Certificate in Agriculture and Certificates in Forestry are fixed to be held on the 24th, 25th, and 26th March.

Examinations for the Society's Bursaries are held annually in October.

COMMITTEES FOR 1891.

1. ARGYLL NAVAL FUND.

Lord ELPHINSTONE, Carberry Tower, Musselburgh, *Convener*.
 The Hon. ROBERT BAILLIE HAMILTON of Langton, Duns.
 Sir DAVID BAIRD of Newbyth, Bart., Prestonkirk.
 DUNCAN FORBES of Culloden, Inverness.
 Captain G. D. CLAYHILLS HENDERSON of Invergowie, R.N., Dundee

2. CHEMICAL AND BOTANICAL.

G. R. GLENDINNING, Hatton Mains, Wilkieston, *Convener*.
 R. SHIRRA GIBB, Boon, Lauder, *Vice-Convener*.
 JOHN M. AITKEN, Norwood, Lockerbie.
 Prof. BAYLEY BALFOUR, Inverleith House.
 DAVID BUTTAR, Corston, Coupar-Angus.
 Dr CLEGHORN of Stravithy, St Andrews.
 W. S. FERGUSON, Pictstonhill, Perth.
 GEORGE HENDERSON, Shidlaw, Coldstream.
 JOHN MARR, Cairnbrogie, Old Meldrum.
 JONATHAN MIDDLETON, Clay of Allan, Fearn, Ross-shire.
 JAMES M'QUEEN of Crofts, Dalbeattie.
 JOHN SPEIR, Newton Farm, Newton, Glasgow.
 DAVID WILSON, yr. of Carbeth, Killearn.
 Dr AITKEN, Chemist, *ex officio*.
 A. N. M'ALPINE, Botanist, *ex officio*.

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 Rev. JOHN GILLESPIE, Mouswald Manse, Ruthwell, R.S.O.
 W. J. MAXWELL, yr. of Munches, Terraughtie, Dumfries.
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 CHARLES HOWATSON, House of Glenbuck, Glenbuck.
 ALEX. MURDOCH, Garteraig, Shettleston.
 JAMES T. S. ELLIOT of Wollelee, Hawick.
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 W. S. FERGUSON, Pictstonhill, Perth.
 DAVID M'GIBBON, Ardnacraig, Campbeltown.
 JOHN CRAIG, Innergeldie, Comrie.

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 PATRICK STIRLING of Kippendavie, Dunblane.
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 J. T. S. PATERSON, 55 Grange Loan, Edinburgh.
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 JAMES D. PARK, Engineer, *ex officio*.

9. PUBLICATIONS, ORDNANCE SURVEY, AND REPORTS OF MEETINGS.

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 Dr A. P. AITKEN, 8 Clyde Street, Edinburgh.
 Dr CLEGHORN of Stravithy, St Andrews.
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 A. F. IRVINE of Drum.
 C. J. MACKENZIE of Portmore, Eshiels, Peebles.
 R. G. WARDLAW RAMSAY of Whitehill, Rosewell.

10. VETERINARY.

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 ALEX. M. GORDON of Newton, Inch, Aberdeenshire.
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 ANDREW MACKENZIE, Dalmore, Alness.
 PATRICK STIRLING of Kippendavie, Dunblane.
 GEORGE J. WALKER, Portlethen, Aberdeen.
 Professor WILLIAMS, *ex officio*.

The President, Vice-Presidents, the Treasurer, and Honorary Secretary and members *ex officio* of all Committees.

AGRICULTURAL EDUCATION.

CERTIFICATE AND DIPLOMA IN AGRICULTURE.

COUNCIL ON EDUCATION.

By a Supplementary Charter under the Great Seal, granted in 1856, the Society is empowered to grant Diplomas.

Members of Council named by Charter.

The PRESIDENT of the HIGHLAND AND AGRICULTURAL SOCIETY—*President*.
The LORD JUSTICE-GENERAL—*Vice-President*.

The LORD ADVOCATE.

The DEAN OF FACULTY.

The PROFESSOR OF AGRICULTURE.

The PROFESSOR OF ANATOMY.

The PROFESSOR OF BOTANY.

The PROFESSOR OF CHEMISTRY.

The PROFESSOR OF NATURAL HISTORY.

Members of Council nominated by Society.

The MARQUIS OF LOTHIAN, K.T.

Sir WILLIAM S. WALKER, K.C.B.

ROBERT DUNDAS of Arniston.

JOHN MUNRO of Kinloss, Cupar-Fife.

JAS. HOPE, East Barns, Dunbar.

Rev. JOHN GILLESPIE, Mouswald, Ruthwell, R.S.O.

R. G. WARDLAW RAMSAY of Whitehill, Rosewell.

Board of Examiners.

1. *Science and Practice of Agriculture*.—Professor WALLACE, University, Edinburgh; JOHN MUNRO of Kinloss, Cupar-Fife; JAMES HOPE, East Barns, Dunbar; and JAS. BIGGAR, yr. of Chapelton, Dalbeattie.
2. *Botany*.—Dr CLEGHORN of Stravithy, St Andrews, and A. N. M'ALPINE, Edinburgh.
3. *Chemistry*.—Dr A. P. AITKEN, Edinburgh, and Dr WILLIAM CRAIG, Edinburgh.
4. *Natural History*.—Professor COSSAR EWART, Edinburgh, and Dr RAMSAY H. TRAQUAIR, Edinburgh.
5. *Veterinary Science*.—Professor WILLIAMS, Edinburgh, and FINLAY DUN, F.R.C.V.S., Edinburgh.
6. *Field-engineering*.—DAVID ALAN STEVENSON, C.E., Edinburgh, and A. W. BELFRAGE, C.E., Edinburgh.
7. *Book-keeping*.—WILLIAM HOME COOK, C.A., Edinburgh, and J. WILSON BRODIE, C.A., Edinburgh.

Standing Acting Committee.

The LORD JUSTICE-GENERAL—*Convener*.

The PROFESSOR OF AGRICULTURE.

The PROFESSOR OF BOTANY.

The PROFESSOR OF CHEMISTRY.

JOHN MUNRO of Kinloss, Cupar-Fife.

Rev. JOHN GILLESPIE of Mouswald.

R. G. WARDLAW RAMSAY of Whitehill, Rosewell.

BYE-LAWS.

I. That, in terms of the Charter, the Society shall nominate seven members to act on the Council on Education.

II. That the Council shall appoint a Board of Examiners on the following subjects :—Science and Practice of Agriculture ; Botany ; Chemistry ; Natural History ; Veterinary Science ; Field Engineering ; and Book-keeping.

III. That the examinations shall be both written and oral, that the value of the answers shall be determined by numbers, and that the oral examinations shall be public.

IV. That there shall be two examinations,¹ to be styled respectively the "First-Class Certificate Examination" and the "Diploma Examination."

V. That to pass the "First-Class Certificate Examination," a candidate must be acquainted with the science and practice of agriculture, botany, chemistry, natural history, veterinary science, field-engineering, and book-keeping ; and that a certificate in the following terms, bearing the corporate seal and arms of the Society, signed by the President or Vice-President of the Council on Education, the Examiners, and by the Secretary, shall be granted to candidates passing this examination :—

"These are to certify that on the _____, A. B. was examined, and has been found to possess a knowledge of the science and practice of agriculture, botany, chemistry, natural history, veterinary science, field-engineering, and book-keeping."

VI. That to pass the "Diploma Examination," a candidate must possess a *thorough knowledge* of the science and practice of agriculture, botany, chemistry, natural history, veterinary science, field-engineering, and book-keeping ; and that a diploma in the following terms, bearing the corporate seal and arms of the Society, and signed by the President and Vice-President of the Council on Education, the Examiners, and by the Secretary, shall be granted to candidates passing this examination :—

"These are to certify that on the _____, A. B. was examined, and has been found to be proficient in the science and practice of agriculture, botany, chemistry, natural history, veterinary science, field-engineering, and book-keeping."

VII. That each successful candidate for the Society's Agricultural Diploma shall thereby become eligible to be elected a free life member of the Society.

VIII. That five bursaries of £20 each shall be open for competition, the subjects of examination being the ordinary branches of an English education, the method and standard of examination to be determined by the Directors. Each candidate shall make a written declaration before being examined that it is his intention to pursue Agriculture as a business. £10 shall be paid to each holder of the bursaries on 1st March, on presentation of a certificate from the professor or teacher that he has regularly attended up to that date and obtained a certificate of at least 60 per cent in the class examinations, the class of Agriculture in the University of Edinburgh, the Technical College, Glasgow, or such other class as may be approved and sanctioned by the Board of Directors ; the remaining £10 shall not be paid unless and until the bursar is awarded the Diploma of the Society, either at the close of the session or twelve months thereafter.

¹ The examinations will be held this year on the 24th, 25th, and 26th March, candidates being required to lodge intimation before the 16th of March.

The Regulations for the Examination of Candidates for Bursaries, and Examination Papers, 1890, will be found on pages 20 and 21.

IX. That a Standing Acting Committee of the Council on Agricultural Education shall be appointed by the Directors.

Note.—The list of Diploma Free Life Members is published in vol. iii., fifth series, of the Society's 'Transactions.'

The following have obtained

FIRST-CLASS CERTIFICATES.

- | | |
|---|--|
| 1867. *J. C. BOWSTEAD, Halkthorpe Hall, Penrith. | 1884. *W. STIRLING, Dean's Court, St Andrews. |
| 1868. JAMES TAYLOR, Clashfarquhar, Aberdeen. | 1885. *HENRY CHAVASSE, Castle Townshend, Cork. |
| 1873. *R. C. B. WILLIS, Cheltenham. | 1885. A. R. DUNNET, Auchengill, Keiss, Caithness. |
| 1875. GEORGE H. CATT, 44 Middle Street, Brighton. | 1885. ALEX. EDWARD, 1 Macdonald Street, Dundee. |
| 1875. ROBERT EWING, Reporter, late Edinburgh. | 1885. JOHN M. RAMSAY, Hope Park, Cupar-Fife. |
| 1875. JOHN SCOTT, Edinburgh. | 1886. *BASIL S. CAVE, Queensberry House, Richmond, Surrey. |
| 1876. CECIL C. BAKER, 2 Bloomsbury Place, London. | 1886. *EDGAR DUDLEY, 37 Thornhill Road, Barnsbury, London. |
| 1876. *PERCY H. CATHCART, 16 Oakley Square, London. | 1886. JOHN EDWIN MACKENZIE, 15 Albany Street, Edinburgh. |
| 1876. JOHN M'CAIG, Kilhilt, Stranraer. | 1886. *J. RENNIE, Wellercroft, Helensburgh. |
| 1876. C. E. M. RUSSELL, Ballielisk, Dollar. | 1886. *WILLIAM R. RICHARDSON, Collyhurst Lodge, Whalley Range, Manchester. |
| 1878. W. M. ANDERSON, Pirntaton, Stow. | 1886. *C. G. FREER THONGER, Lordswood Place, Harborne, Staffordshire. |
| 1879. *M. FALCON, Stainburn, Workington. | 1887. *KHOSHIEROO B. JADHAVA, Baroda, Bombay. |
| 1880. WILLIAM BROWN, Watten Mains, Caithness. | 1887. *PANDIT SRILAL, Misra, Mahaban, Dist. Muthra, N.W.P., India. |
| 1880. ALEX. INGLIS, Tynninghame, Prestonkirk. | 1888. D. W. COLLYER, Craignethan, Weston-super-Mare, Somerset. |
| 1880. JAMES M'LAGGAN, Cobbleheugh, Dinnet, Aberdeenshire. | 1888. F. O. SOLOMON, Southfield, Dartford, Kent. |
| 1880. R. A. MALLOCH, Balhaldie, Braco, Perthshire. | 1888. W. H. A. T. WATSON, 65 Eccleston Square, London, W. |
| 1881. DANIEL BAIN, Wick. | 1889. T. A. COWARD, Eden Town, Carlisle. |
| 1881. *ALFRED HARDIE, Oxford House, Stockport. | 1889. *ASH RUDD, East Ruston Hall, Stalham, Norwich. |
| 1882. DANIEL FINLAYSON, Carter's, Seedsman, London. | 1889. A. W. WOODBURN, 6 Sardinia Terrace, Hillhead, Glasgow. |
| 1882. BENJAMIN HEPBURN, Preston Mains, Prestonkirk. | 1890. GEORGE CRUICKSHANK, Comisty, Huntly. |
| 1882. J. RODGER, Mertoun, St Boswells | 1890. WILFRID JAMES FLEET (St Petersburg), Marchmont, Duns. |
| 1883. ALEX. H. GIBSON, Kirkcaldy. | 1890. GEORGE PEARSE FODDEN, Sparham House, Ashburton. |
| 1883. ARTHUR HERBERT KERR, Crookham, Farnham. | 1890. JAMES WEIR, Woodilee Farm, Lenzie. |
| 1883. *PATRICK L. MAITLAND, Perry-mead House, Bath. | |
| 1883. HENRY B. MAYNE, Brantridge, Balcomb, Sussex. | |
| 1883. ROBERT ROUSE PETER, Buenos Ayres, South America. | |
| 1884. *W. A. SANDERS, Sanders Park, Co. Cork. | |

* Those marked with an asterisk * are Members of the Royal Agricultural College, Cirencester.

SYLLABUS OF EXAMINATION

FOR CERTIFICATES AND DIPLOMA.

I.—SCIENCE AND PRACTICE OF AGRICULTURE.

1. Geological strata—surface geology—formation of soils—their classification—chemical and physical characters and composition—suitability for cultivation. 2. The principle of rotations—rotations suitable for different soils—systems of farming. 3. The composition of (a) manures—general and special—amounts used per acre—period and mode of application. The composition of (b) feeding substances—their suitability for different classes of farm stock—considerations affecting their use. 4. “How crops grow”—our farm crops—their cultivation—diseases—insect injuries and remedies—their chemical composition. The formation and management of plantations. 5. The principles on which drainage, irrigation, and warping operations should be based and carried out. The application of lime—marl—clay, &c. 6. Meteorology, or the laws of climate as affecting plant-life—the influence of light and heat on cultivation—of absorption and retention of heat and moisture—of porosity and capillarity in soils. 7. The breeding, rearing, feeding, and general treatment of farm stock—the different breeds of horses, cattle, sheep, and pigs—their characteristics—the districts where they are generally met with. 8. The machines and implements used in farming—their uses, prices, and the principal points to be attended to in their construction. 9. The “prime movers,” or sources of power used in agriculture: man—horse—wind—water—steam—their relative values and advantages. *Text-books*—Morton’s ‘Cyclopedia of Agriculture,’ Blackie & Son; Wallace’s ‘Farm Live Stock,’ Oliver & Boyd; Harris’s ‘Cheese and Butter Maker’s Handbook,’ Dunn & Wright; McConnell’s ‘Agricultural Note-Book,’ Crosby Lockwood & Co.; ‘Our Farm Crops,’ Blackie & Son; ‘How Crops Grow,’ Macmillan & Co.; Warrington’s ‘Chemistry of the Farm,’ Bradbury, Agnew, & Co.; McAlpine’s ‘Grasses’; Geikie’s ‘Outlines of Geology.’

II.—BOTANY.

1. Nutritive Organs of Plants.—Root, stem, leaves. Functions of roots. Various kinds of stem, with examples. Use of the stem. Structure of leaves. Different kinds of leaves. Arrangement and functions of leaves. 2. Reproductive Organs—Flower and its parts. Arrangements of the whorls of the flower—calyx, corolla, stamens, pistil. Ovule. Mature pistil or fruit. Pruning and grafting. Seed. Young plant or embryo. Sprouting of the seed, or germination. 3. General Principles of Classification.—Meaning of the terms Class, Order, Genus, and Species. Illustrations of natural orders taken from plants used in agriculture, such as grain-crops, grasses, clovers, vetches, turnips, mangel-wurzel, peas, beans, &c. Practical examination in fresh specimens and models; some of the latter may be seen in the Museum, at the Royal Botanic Garden, which is open daily to the public, free. *Text-book*—Balfour’s ‘Elements of Botany,’ A. & C. Black, 1876, price 3s. 6d.

III.—CHEMISTRY.

The general principles of chemical combination. The chemistry of the more commonly occurring elements, and their more important compounds. The chemical processes concerned in agriculture generally. The changes

which take place in the germination, growth, and maturation of plants, in the weathering and manuring of soils, &c. The composition and chemical character of the common mineral manures. *Text-books*—Roscoe's 'Lessons in Elementary Chemistry,' Macmillan & Co., London, price 4s. 6d.; Johnston and Cameron's 'Elements of Agricultural Chemistry and Geology'; Johnston's 'How Crops Grow,' Macmillan & Co., London; Warrington's 'Chemistry of the Farm,' Bradbury, Agnew, & Co., London.

IV.—NATURAL HISTORY.

1. ZOOLOGY.

1. The characters distinguishing the primary divisions of the Animal Kingdom. 2. The Orders of the Class Insecta. 3. The principal insects injurious to crops. 4. The animal parasites, external and internal, affecting domestic animals; their life-histories and position in the zoological scale. 5. The Chordate or Vertebrate Type, with its subdivisions. 6. The Orders of Mammalia, with special reference to the domestic and wild mammalia of Great Britain. *Text-book*—Nicholson's 'Introductory Text-book of Zoology,' William Blackwood & Sons, Edinburgh and London.

2. GEOLOGY.

7. The various strata forming the earth's crust in their order of deposition. 8. Their influence on the surface soils of the country. 9. The meaning and application of Disintegration, Drift, Alluvium, Dip, Strike, Fault. *Text-books*—Page's 'Introductory Text-Book of Geology' and Lyell's 'Students' Elements of Geology.'

V.—VETERINARY SCIENCE.

1. Anatomy of the digestive organs of horse and ox, describing their structural differences. 2. The process of digestion in the above animals, and food most proper for each in quantity and quality. 3. The management of stock before, at, and after parturition. The time of utero-gestation in the domesticated animals. 4. The general principles to be followed in the treatment of acute and common diseases before assistance of the veterinary surgeon can be procured. *Text-books*—'Youatt on Sheep,' price 7s. 6d.; Steel's 'Diseases of the Ox,' price 15s.; Williams's 'Principles and Practice of Veterinary Surgery,' price 30s.; Williams's 'Principles and Practice of Veterinary Medicine,' price 30s., MacLachlan & Stewart, Edinburgh.

VI.—FIELD-ENGINEERING.

1. Land-surveying with the chain. 2. Mensuration of areas of land, in imperial and Scotch acres, from a chain survey or from a plan. 3. Levelling with the ordinary levelling instrument and staff, and calculating levels and gradients. *Text-books*—'Rudimentary Treatise on Land and Engineering Surveying,' by T. Baker, C.E.; 'Weale's Series,' price 2s. Part i. chaps. 1, 2, 3, and 6, and part ii. chap. 1, to be read.

VII.—BOOK-KEEPING.

1. Questions in Practice and Proportion. 2. Book-keeping—Describe books to be kept; give examples—taking of stock. *Text-book*—Stevens' 'Practical System of Farm Book-keeping,' William Blackwood & Sons, Edinburgh, price 2s. 6d.

EXAMINATION PAPERS, 1891.

AGRICULTURE.

1. Describe the natural process of weathering of rock-substance which takes place in the formation of soils.

2. How is the organic portion of soil formed? What are the functions, and by what means are the ingredients which it contains made available for the plant?

3. Describe the actions of lime in soils. In what quantities and in what condition ought lime to be applied to (a) light sandy land, (b) peaty land, and (c) heavy land? and give reasons why.

4. What is slag phosphate? In what quantities, in what condition, and under what circumstances is it advantageous to apply it as manure to land?

5. Explain the working of an ordinary manual-delivery reaping-machine. How many acres of oats should be cut per day, working on one side only? How many hands would be required to cut and set up the crop, and how much should a fairly good crop cost for wages per acre?

6. Give in detail the cultivation of a turnip crop; enumerate the diseases and insect attacks to which the crop is liable, and state the best remedies to employ to free the crop from the consequent injuries.

7. Given a farm of 600 acres of medium arable land (200 acres of which are laid down to permanent pasture) in the district of which you have experience, state in detail the method of working the rotation of crops and numbers of stock, and show the amount of capital required under the various headings of live stock, dead stock, manure, feeding-stuffs, and sundry working expenses.

8. You buy in August 200 half-bred lambs at 30s. each; they are in good condition, and you want to sell them fat in January. How would you manage them, how much turnips would they consume, and what would be a fair return for keep?

(Three hours allowed.)

BOTANY.

1. What are the peculiarities presented by the foliage of the following plants?—(a) red clover, (b) birdsfoot trefoil, (c) vetch, (d) sainfoin, (e) lucerne.

2. Describe the embryo of wheat, bean, and turnip, and explain in each case how it is nourished during germination.

3. Give a botanical description of the following plants: (a) mangel-wurzel, (b) cocksfoot. Mention their place in the vegetable kingdom, giving family, genus, and species.

4. Explain how the materials found in the soil are taken up by plants, and on what conditions does the amount absorbed depend.

5. Have you seen forestry combined with the cultivation of field crops? Which cereals are often grown in this manner?

(One and a half hour allowed.)

CHEMISTRY.

1. What is meant by oxidation and reduction? Mention two oxidising and two reducing agents. Give examples characteristic of each, describing the conditions under which the actions take place.

2. How are the following substances prepared: Caustic potash, carbonate of soda, oxalic acid, glycerine?

3. What are the chief sources from which plants derive their nitrogen? How do leguminous plants differ from others in their means of obtaining nitrogenous food?

4. Distinguish between *soluble*, *insoluble*, and *reverted* phosphate of lime. What are the conditions favourable to the production of reverted phosphate?

5. How much nitric acid can be made from 15 tons nitrate of soda of 95 per cent purity? $H=1$, $Na=23$, $N=14$, $O=16$.

(One and a half hour allowed.)

NATURAL HISTORY.

ZOOLOGY.

1. Give some account of the insect known as "Hessian fly."

2. Contrast the dentition of the pig, ox, and rabbit.

3. Give the distinguishing characters of the class *Aves*, and those of the two great divisions of living birds.

4. State what you know of *Trichina spiralis* and its life-history.

GEOLOGY.

1. Give the chemical composition and general characters of fluor, hæmatite, arragonite, and dolomite.

2. Explain the terms lamination, foliation, cleavage, false-bedding.

3. What are the circumstances which would lead you to suppose that the Old Red Sandstone of Scotland had a lacustrine origin?

4. State briefly the leading points in the geological history of mammals.

(One and a half hour allowed.)

VETERINARY SURGERY.

1. Name the best way of stopping the progress of, and of treating animals affected with, a contagious and infectious disease.

2. Describe the conformation in cattle indicative of delicacy of constitution.

3. What are the causes and nature of weed in horses?

4. What is the period of gestation in the mare, cow, ewe, and sow?

5. What diseases affect the udder and teats of cows?

6. What is an antiseptic, and how are antiseptics believed to act?

(One and a half hour allowed.)

MENSURATION AND FIELD-ENGINEERING.

NOTE.—Candidates must work out the questions on sheets of paper which will be supplied to them, which sheets must be signed by the candidates, and lodged, along with this examination paper, with the Secretary. The answers to the questions, excepting Nos. 4 and 7, are also to be filled in on this paper.

NOTE OF IMPERIAL MEASURE.

10,000 square links	=	1 square chain.		
625 do.	=	0.0625 do.	=	1 pole.
25,000 do.	=	2.5 do.	=	40 do. = 1 rood.
100,000 do.	=	10 do.	=	160 do. = 4 do. = 1 acre.

The imperial is to the Scotch acre as 1 : 1.261 nearly.

1. Calculate the area of the enclosure A in imperial acres, roods, and poles, and also in acres and decimals.

2. Calculate the area of the triangular enclosure B in imperial acres and decimals.

3. Measure by the scale the enclosure C, mark the measurements necessary to calculate the area from in links on the paper, and calculate from them the area in imperial acres and decimals.

4. In the figure D, HE is an irregular boundary; FG a straight station-line; FH and EG perpendiculars to FG. Measure by the scale, and mark in links on the paper the measurements required in order to survey the boundary HE.

5. Calculate from these measurements the area of the piece of land FHEG, in imperial acres and decimals.

6. The contents of a piece of land being 1500 Scotch acres, required the area in imperial acres and decimals.

7. Write down, as if in a level-book, the staff-readings in feet and decimals shown in sketch section; then reduce the levels beginning at H, so as to calculate the heights of K, L, and M above H,—all in feet and decimals.

8. Calculate the gradients of rates of inclination of the ground between the points H and K, K and L, and L and M.

$$\text{Answer} \begin{cases} \text{H and K} = \\ \text{K and L} = \\ \text{L and M} = \end{cases}$$

(One and a half hour allowed.)

ARITHMETIC AND BOOK-KEEPING.

1. Reduce the following to a decimal fraction, $\frac{1}{3} + \frac{1}{4} + \frac{1}{14} + \frac{3}{35}$.

2. Reduce 3 qrs. 16 lb. to the decimal of 14 cwt. 1 qr. 4 lb.

3. If 72 men dig a trench 20 yds. long, 1 ft. 6 in. broad, 4 ft. deep, in 3 days of 10 hours each, how many men would be required to dig a trench 30 yards long, 2 ft. 3 in. broad, and 5 feet deep, in 15 days of 9 hours each?

4. What is the rent of 23 acres 3 roods 5 poles, at $2\frac{1}{2}$ guineas an acre?

5. I bought oats at 21s. 3d. per qr., and sold them at 22s. 3½d. per qr. What was the gain per cent?

6. A man, his wife, and 3 children earn £1, 7s. 6d. a-week. The wife earns twice as much as each child, and the man 3 times as much as his wife; required the man's weekly earnings.

7. Name the books required by a farmer in order to record his whole transactions in a systematic and correct manner; and assuming that he did so for a year, state briefly the method he would take to bring his books to a balance, and to ascertain his profit or loss on the year's working.

8. The following are the transactions of the farmer for one of the months of the year. Name the books to which they would be transferred, and show the entries:—

- May* 1. Sold A. Cunningham, Leith, 60 qrs. oats at 20s. per qr., and received his bill at 2 months. Paid bill stamp, 9d. Discounted bill—discount, 12s. 2d. Paid into Royal Bank £59, 7s. 1d.
- " 2. Paid housekeeper for household expenses, £5.
- " 6. Received from John Thomson, Edinburgh, £25, price of the six acres corn crop of the west field sold to him last fall.
- " 10. Paid James Buchanan landlord's half of expense of march fence at the east boundary, as per his order, £20.
- " 15. Bought from James Galloway, Leith, 2 sheep-nets at £1, 13s. 6d.; 9 dozen net stakes at 2s. per dozen. Cash to be paid in a month.
- " 15. Drawn from bank, and paid half-yearly servants, £45.
- " 18. Bought polled bull from John Jones, Edinburgh, for £28, luck-penny 5s. Gave him a cheque for the balance.
- " 28. Sold John Turnbull, Edinburgh, 400 stones hay at 8d. per stone—price to be paid in two months.
- " 31. Transferred to-day—2 calves to one-year-old heifers; 2 calves to one-year-old stots; 1 two-year-old heifer to cows.

(One and a half hour allowed.)

BURSARIES.

REGULATIONS FOR EXAMINATION OF CANDIDATES.

1. The examinations shall be conducted simultaneously about the middle of October at the place where the Show was last held in each Show district (in which there are candidates), on the plan followed in the examinations under the Science and Art Department.

2. A paper shall be set by one of her Majesty's inspectors, assistant inspectors of schools, or other person selected for the purpose—the subjects to be embraced being the ordinary branches of an English education.

3. One or more Directors (failing whom, some other member) of the Society in each district shall superintend the examination, which shall be wholly in writing. They shall require each candidate to make a written declaration that it is his intention to pursue Agriculture as a business. They shall open and distribute the papers in the presence of the candidates, and duly transmit their answers to the Secretary.

4. In reporting on the result, the examiner shall state the maximum number of marks in each subject, as well as the number gained by each candidate, with the view of the Board of Directors judging whether any candidate has shown a degree of merit entitling him to a bursary.

5. Candidates must be not less than fourteen years of age, and must be qualified by birth or residence in Scotland. The Council will consider each case on its own merits—their decision to be final.

6. In giving notice of intention to compete for a bursary, applicants must state at which of the following places they wish to be examined,—viz., Edinburgh, Aberdeen, Dumfries, Perth, Glasgow, Melrose, Stirling, Inverness.

Those wishing to compete for bursaries must apply for entry certificate to F. N. Menzies, 3 George IV. Bridge, Edinburgh.

EXAMINATION PAPER, 1890.

SECTION I.

1. Find the gain on 6 tons bought at £3, 3s. 3d. per cwt., and sold at 9d. per lb.

2. If the cost of printing a book of 320 leaves, with 21 lines on each page, and on an average 11 words in each line, be £19, find that of printing a book with 297 leaves, 28 lines on each page, and 10 words in each line.

3. Divide .075 by .0015; 200.21001 by .1001; 3.005 by 2130; $\frac{1.944}{3.266}$ by .00152 (result in decimals).

4. What principal will amount to £455, 8s. in $33\frac{1}{2}$ years at $3\frac{1}{4}\%$ per annum?

5. Find the change in income on transferring £6500 from the $3\frac{1}{2}$ Per Cents at 84 to the 4 Per Cents at 91.

6. A mixture contains 30 lb. of tea worth 2s. 1d. per lb., 25 lb. of tea worth 2s. 4d. per lb., and 60 lb. of tea worth 1s. 9d. per lb. What is the value per lb. of the mixture?

SECTION II.

1. Write an essay on "Scottish National Characteristics," or on "The Pleasures of Observation in a Country Life." (Not more than half an hour should be occupied with this exercise.)

2. Remark on the origin and formation of the following words: eccentricity, spinster, prophetic, yacht, invention, telephone, prejudice.

3. Give a general analysis of the following passage, pointing out the function of each clause:—

"The kindly fate who watches over the interests of men without inquiring whether they deserve her aid, solved the difficulty for him the same evening by giving him Miss Pollock to take in to dinner at the house at which he dined."

Parse the words underlined: what is the construction of "giving"?

SECTION III.

1. What circumstances determine the climate of the different districts of France? What are the characteristic productions of each district?

2. Give the situation and state what you know of each of the following places : Belfast, Munich, Saragossa, Havana, Rangoon, Massowah, Belize.
3. Give some account of *two* of the following persons : John Knox, Oliver Cromwell, George Washington, John Bright.
4. (Only *one* of the following should be attempted.)
 - (a) Describe experiments showing that heat expands various substances, solid, liquid, and gaseous.
 - (b) Describe the structure of a grain of wheat.
 - (c) Explain the action of the common pump.

VETERINARY DEPARTMENT.

The Society established a Veterinary Department in 1823, but by an arrangement made with the Royal College of Veterinary Surgeons, the Society's examination ceased in 1881. Holders of the Society's Veterinary Certificate are entitled to become Members of the Royal College of Veterinary Surgeons on payment of certain fees, without being required to undergo any further examination. The number of Students who have passed for the Society's Certificate is 1183.

In 1874, the Society resolved to vote annually eight silver medals for Class Competition to each of the two Veterinary Colleges in Edinburgh, and to the one in Glasgow.

FORESTRY DEPARTMENT.

The Society grants FIRST and SECOND CLASS CERTIFICATES in FORESTRY.

BOARD OF EXAMINERS.

1. *Science of Forestry and Practical Management of Woods*.—Dr CLEGHORN of Stravithy, St Andrews; JOHN MACGREGOR, Ladywell, Dunkeld; WILLIAM M'CORQUODALE, Scone Palace, Perth; J. GRANT THOMSON, Grantown, Strathspey.
2. *Elements of Botany*.—Dr CLEGHORN and Professor BAYLEY BALFOUR.
3. *Elements of Chemistry*.—Dr WM. CRAIG and Dr A. P. AITKEN, Edinburgh.
4. *Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to Fencing, Drainage, Bridging, and Road-making*.—A. W. BELFRAGE, C.E., Edinburgh.
5. *Book-keeping and Accounts*.—WM. HOME COOK, C.A., Edinburgh.

Candidates must possess—1. A thorough acquaintance with the theory and practice of Forestry. 2. A general knowledge of the following branches of study, so far as these apply to Forestry: The Elements of Botany; Elementary Chemistry, especially as applied to Atmosphere, Water, Soil, and Vegetation; Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to fencing, draining, bridging, and road-making; Implements of Forestry; Book-keeping and Accounts. The examinations are open to candidates of any age.

The following have obtained First-Class Certificates:—

GEORGE YOUNG WALL, M.R.A.C., Durham,	1870
WILLIAM BAILLIE, Forester, Whittinghame, East Lothian,	1871
WILLIAM ROBERTSON, Forester's House, Lauder,	1871
PETER LONEY, Marchmont, Duns,	1873
JOHN M. AITKEN, Norwood, Lockerbie,	1880
RICHARD HENDERSON, Portland Estates Office, Kilmarnock,	1880
A. H. GIBSON, Kirkcaldy,	1882
ALEX. INGLIS, Tynninghame, Prestonkirk,	1882
PETER REID, Port Ellen, Islay,	1884
JOHN WILSON, St Andrews,	1884
CECIL HENRY HOOPER, M.R.A.C., Painshill, Cobham, Surrey,	1886
WILLIAM SOMERVILLE, Lecturer on Forestry, Edinburgh University,	1886
JOHN BARDGETT, Sockbridge Mill, Tirril, Penrith,	1887
WILFRED JAMES FLEET, Marchmont, Duns,	1888
ARTHUR CHARLES FORBES, Knowefield, Carlisle,	1888
A. J. FARQUHARSON, Newtyle, Forfarshire,	1890

The following have obtained Second-Class Certificates:—

JOHN M'EWEN, Yellow Cottage, Killin,	1880
THOMAS BERWICK, 56 North Street, St Andrews,	1885
DONALD C. CAMERON GRANT, Southleigh, Murrayfield,	1886

SYLLABUS OF EXAMINATION.

1.—SCIENCE OF FORESTRY AND PRACTICAL MANAGEMENT OF WOODS.

1. Structure, formation, and ripening of Wood. Predisposing causes of decay. 2. Restoration of Wood-lands:—(1) Natural reproduction; (2) Artificial planting. 3. General management of plantations. Cropping by rotation. Trees recommended for different situations. 4. Season and methods of pruning, thinning, and felling. 5. Circumstances unfavourable to the growth of trees. 6. Mechanical appliances for conveying and converting timber. The different implements and tools used in planting, pruning, felling, barking, and working up timber trees, or preparing them for sale. Construction of saw-mills. 7. Qualities and uses of chief indigenous timbers. 8. Management of nurseries. Seed-sowing. 9. Collection of forest produce. 10. Mammals, birds, and insects which are destructive to trees.

Books recommended.—‘Theory and Practice of Horticulture,’ Lindley; ‘Arboriculture,’ Grigor, 10s. 6d.; ‘Sylviculture,’ Bagneris, 5s.; ‘Coniferae,’ Veitch; ‘Injurious Insects,’ Ormerod, 3s.

Candidates are also obliged to undergo a Practical Examination in Forestry.

II.—ELEMENTS OF BOTANY.

1. Nutritive Organs of Plants.—Root, stem, leaves. Functions of roots. Various kinds of stems, with examples. Use of the stem. Structure of leaves. Different kinds of leaves. Arrangement and functions of leaves. 2. Reproductive Organs.—Flower and its parts. Arrangement of the whorls of the flower—calyx, corolla, stamens, pistil. Ovule. Mature pistil or fruit. Pruning and grafting. Seed. Young plant or embryo. Sprouting of the seed or germination. 3. General Principles of Classification.—Meaning of the terms Class, Order, Genus, Species. Illustrations taken from common forest trees and shrubs. Practical examination on fresh specimens and models. These may be seen in the Museum at the Royal Botanic Garden, which is open to the public. Candidates may consult Professor Balfour’s ‘Elements of Botany,’ A. & C. Black, Edinburgh, 3s. 6d.; Oliver’s ‘Elementary Lessons in Botany,’ London, 4s. 6d.

III.—CHEMISTRY.

Candidates are required to have an elementary knowledge of Chemistry, such as to enable them to classify the most commonly occurring elements and their most familiar compounds, and to describe their chief characters.

They will be examined more particularly on the following subjects:—

Atmosphere.—Its composition and physical properties,—the causes of changes in its temperature and pressure, and the measurement of these changes by means of the thermometer and barometer. The formation of rain and dew. Gases injurious to vegetation.

Water.—The effects of heat upon it; its movements, its solvent properties, the methods of regulating the supply of water by drainage and irrigation. The characteristics of rain-water, spring-water, and surface-water. The relations of water to the growth and health of plants, and to the climatic conditions of a district.

Soil.—The description and classification of soils, and their suitability to the growth of different descriptions of timber trees. The composition of soils, with special reference to the constituents on which their fertility depends, or which are the cause of their sterility. The changes produced in the composition of soils by various physical operations, such as drainage, irrigation, mulching, removal of leaves, &c., and by liming, salting, and manuring.

Vegetation.—The influence of temperature, rainfall, altitude, aspect, and shelter, upon the growth of trees. The conditions favourable to germination. The effects of light, heat, and ventilation upon the growth of trees.

Forest Products.—The preparation and chemical characters of charcoal, potashes, tar, and turpentine.

Preservation of Timber.—Creasoting, kyanising, &c.

Books recommended.—‘First Principles of Agriculture,’ Tanner (Macmillan & Co.); ‘Physics Primer,’ Balfour Stewart; ‘Inorganic Chemistry,’ by George Wilson (Chambers).

IV.—LAND AND TIMBER, MEASURING AND SURVEYING; MECHANICS AND CONSTRUCTION AS APPLIED TO FENCING, BRIDGING, AND ROAD-MAKING.

1. The use of the level and measuring chain. Measuring and mapping surface areas. 2. The measurement of solid bodies—as timber, stacked bark, fagots, &c., earthwork. 3. The different modes of fencing and enclosing plantations; their relative advantages, durability, cost of construction, and repairs. 4. The setting out and formation of roads for temporary or permanent use. 5. The construction of bridges over streams and gullies; of gates or other entrances. Strachan’s ‘Agricultural Tables,’ Oliver & Boyd, Edinburgh, price 2s. 6d.; or Horton’s Tables.

V.—BOOK-KEEPING AND ACCOUNTS.

1. Questions in Practice and Proportion. 2. Book-keeping—describe books to be kept; give examples. Taking of stock.

EXAMINATION PAPERS, 1891.

PRACTICAL FORESTRY.

1. State shortly the direct and indirect utility of forests—(a) Forest produce; (b) mechanical effect; (c) hygienic effect; (d) ornamental effect.

2. Should plantations of considerable extent be pure or mixed woods? State the advantages and disadvantages.

3. What species of trees are generally best suited for plantations—(a) For shelter; (b) profit (timber, firewood); (c) ornament?

4. What are the advantages and drawbacks of the various silvicultural systems—Clear cutting, coppice system, coppice with standards, high forests with standards?

5. What trees suffer most from wind? Do you advise any special shelter along the edge of woods?

(Two hours allowed.)

BOTANY.

1. What functions are performed by roots? Show how the structure of the root is adapted to the performance of its functions.
2. When a flower is expanded, what takes place in order that seeds may be produced by it? Select some individual flower with the structure of which you are acquainted, and describe it.
3. What is grafting? Describe the chief methods of grafting? What object is aimed at in grafting? What are the main points to be attended to in carrying out the operation?
4. Enumerate the chief natural orders of the British Flora producing timber trees, and mention their distinguishing features.
5. What is the influence of light on the growth of plants, and what of darkness?
6. Mention some trees in plantations which suffer quickly from overcrowding and shade; others which bear a considerable amount of shade of the overwood.

(One and a half hour allowed.)

CHEMISTRY.

1. Describe the physical and chemical properties of carbonic acid. Of what substance in the soil is it a solvent?
2. Explain what is meant by "nitrification" in soils, and describe the conditions most favourable to the process.
3. Describe the manufacture of charcoal, and explain three distinct uses of charcoal.
4. In what circumstances is liming of land beneficial, and what are the physical and chemical changes produced by it?

(One and a half hour allowed.)

LAND AND TIMBER MEASURING AND SURVEYING; MECHANICS AND CONSTRUCTION AS APPLIED TO FENCING, DRAINAGE, BRIDGING, AND ROAD-MAKING.

1. What is required so as to be certain of the correct adjustment of a spirit-level for accurate sights?
2. Make form of level-book on separate paper, with four sights marked with imaginary lengths and remarks.
3. Make sketch section of same to imaginary scale, marking on total heights from datum with the imaginary lengths from starting-point.
4. Describe the different kinds of fences, and where suitable, keeping expense in view.
5. Draw sketch of best construction for wooden gate.
6. Draw sketch of wooden bridge of 30 feet span over ravine above burn.
7. Describe method of road-making of permanent character of 30 feet width.

(Two hours allowed.)

ARITHMETIC AND BOOK-KEEPING.

1. How many feet and yards are there in $326\cdot592$ square inches? How many feet and yards in 13,856,832 cubic inches?
2. Eight men accomplished 30 yards of ditching in 12 days, working 8 hours per day; in what time will 12 men finish a ditch, supposing its whole length is 60 yards, when they work only 6 hours per day?
3. A beam 16 feet long, $2\frac{1}{4}$ feet broad, and 8 inches thick weighs 1280 lb.; what must be the length of another beam of the same material, whose breadth is $3\frac{1}{4}$ feet, thickness $7\frac{1}{2}$ inches, and weight 2028 lb.?
4. Find the cost of 48 square yards, 8 square feet, and 114 square inches, at 13s. $7\frac{3}{4}$ d. per sq. yard.
5. What is the cost of 145 acres 3 roods 15 perches, at £18, 6s. per acre?
6. A and B each lend £256 for three years at $4\frac{1}{2}$ per cent per annum, one at simple interest, the other at compound interest; find the difference of interest they respectively receive.
7. Describe briefly the books a forester ought to keep, and their nature and use.

(One and a half hour allowed.)

CHEMICAL DEPARTMENT.

Chemist to the Society—Dr A. P. AITKEN, Chemical Laboratory,
8 Clyde Street, Edinburgh.

The object of the Chemical Department is to promote the diffusion of a knowledge of Chemistry as applied to agriculture among the members of the Society, to carry out experiments for that purpose, to assist members who are engaged in making local experiments requiring the direction or services of a chemist, to direct members in regard to the use of manures and feeding stuffs, to assist them to put the purchase of these substances under proper control, and in general to consider all matters coming under the Society's notice in connection with the Chemistry of Agriculture.

MEMBERS' PRIVILEGES IN RESPECT OF ANALYSES.

The fees of the Chemist for analyses made for members of the Society shall be as follows:—

The estimation of *one* ingredient in a manure or feeding stuff, . . . 5s.

The estimation of *two or more* ingredients in . . . do. . . 10s.

These charges apply only to analyses made for agricultural purposes, and for the sole and private use of members of the Highland and Agricultural Society who are not engaged in the manufacture or sale of the substances analysed.

If the sample represents a substance bought under a guarantee, and if it is found to be notably deficient, the Chemical Committee shall take cognisance of such deficiency in the same manner as they do in the case of deficient manures and feeding stuffs supplied to members of analytical associations (see page 30), provided that the Society's regulations as regards sampling are carried out, and that the seller's guarantee accompanies the sample.

Also, that valuations of manures, according to the Society's scale of units (see page 40), shall be supplied in all cases in which the cash price asked by the seller accompanies the sample.

The following analyses are made for *five shillings*:—

Simple Nitrogenous Manures—viz., nitrate of soda, sulphate of ammonia, horn dust, dried blood, meat meal, shoddy, soot, &c.

Simple Phosphatic Manures—viz., mineral phosphates, phosphatic guano, basic slag, &c., superphosphate (soluble phosphate only).

Simple Potassic Manures—viz., sulphate of potash, muriate of potash, potashes, &c.

The following analyses are made for *ten shillings*:—

Manures—viz., all compound and mixed manures, e.g., bone meal, dissolved bones, guanos, composts, &c.

Feeding Stuffs—viz., oilcakes, meals, and compounds.

MISCELLANEOUS.

Analysis of water to determine purity, hardness, and fitness
for domestic use £1 0 0

Analysis of agricultural products—hay, grain, ensilage, roots,
&c. 1 0 0

Analysis of soil, to determine fertility and recommendation
of manurial treatment 2 0 0

Examination of food or viscera for metallic poison	£2 0 0
Examination of food or viscera for alkaloid poison . . .	2 0 0

Samples should be sent (carriage paid) to Dr A. P. Aitken, 8 Clyde Street, Edinburgh.

INSTRUCTIONS FOR SELECTING SAMPLES FOR ANALYSIS.

MANURES.

Four or more bags should be selected for sampling. Each bag is to be emptied out separately on a clean floor, worked through with the spade, and one spadeful taken out and set aside. The four or more spadefuls thus set aside are to be mixed together until a uniform mixture is obtained. Of this mixture one spadeful is to be taken, spread on paper, and still more thoroughly mixed, any lumps which it may contain being broken down with the hand. Of this mixture two samples of about half a pound each should be taken by the purchaser or his agent, in the presence of the seller or his agent or two witnesses (due notice having been given to the seller of the time and place of sampling), and these samples should be taken as quickly as possible, and put into bottles or tin cases to prevent loss of moisture, and having been labelled, should be sealed by the samplers—one or more samples to be retained by the purchaser, and one to be sent to the chemist for analysis.

FEEDING STUFFS.

Samples of feeding compounds should be taken in a similar manner.

Samples of cake should be taken by selecting three cakes, breaking each across the middle, and from the broken part breaking off a segment across the entire breadth of the cake. The three segments thus obtained should be wrapped up and sealed by the samplers, and sent for analysis as in the case of manures, and three duplicate segments similarly sealed and labelled should be retained by the purchaser.

SOILS.

Dig a little trench about two feet deep, exposing the soil and subsoil. Cut from the side of this trench horizontal scrapings of the soil down to the top of the subsoil. Catch these on a clean board, and collect in this manner about one pound weight of soil taken from the whole surface of the section. Similar scrapings of subsoil immediately below should be taken and preserved separately. Five or six similarly drawn samples should be taken from different parts of the field, and kept separate while being sent to the chemist, that he may examine them individually before mixing in the laboratory.

VEGETABLE PRODUCTS.

Turnips, &c., 20 to 30 carefully selected as fair average bulbs.

Hay, straw, ensilage, &c., should be sampled from a thin section cut across the whole stack or silo, and carefully mixed about ; about 2 lb. weight is required for analysis.

Grain should be sampled like manures.

DAIRY PRODUCE.

Milk.—Samples of milk from individual cows should be taken direct from the milk-pail. Average samples from a number of cows should be taken immediately after milking. Samples to be tested for adulteration should not be drawn from the bottom or taken from the top of standing milk, but they should be ladled from the vessel after the milk has been thoroughly mixed.

For most purposes a quart-bottle of milk is a large enough sample.
Butter and Cheese.—About quarter-pound samples are required.

WATERS.

Samples of water for analysis should not be put into ordinary wine bottles or stoneware jars stopped with corks, as these usually vitiate the samples. Clear glass Winchester quarts with glass stoppers should be used. Cases containing these, chemically cleaned, are forwarded from the laboratory on application.

Well-water should be allowed to run for some time before the sample is drawn.

Standing water from cisterns, tanks, ponds, &c., should be sampled by immersing the bottle entirely under the water, and holding it, neck upwards, about four inches below the surface.

Spring or stream water should be sampled in dry weather, by immersion, if possible; but if not deep enough for that purpose, a perfectly clean cup or glass should be used for transferring the water to the bottle.

When the bottle has been filled the stopper should be rinsed in the water before replacing.

Samples should be despatched to the laboratory *immediately* after being taken.

LOCAL ANALYTICAL ASSOCIATIONS.

I. With the view of encouraging, as well as regulating the conduct of, Local Analytical Associations, the Society contributes from its funds towards their expenses a sum not exceeding £250 annually.

II. The amount of such contribution is to each association at the rate of 10s. for each full analysis, and 5s. for each partial analysis¹ of manure or feeding stuff affected, or such proportion thereof as the above annual contribution may permit of. The pecuniary assistance thus offered is subject to the following conditions being complied with to the satisfaction of the Chemical Committee:—

1. That the rules of the association are submitted to and approved of by the Chemical Committee.

2. That it is a condition of participating in the grant that the association make analyses for members of the Highland and Agricultural Society, being farmers and not members of the local association, charging them the cost price to the association, less the amount recovered from the Society.

3. That the association is managed by a committee of practical farmers owning or occupying land in the district.

4. That the analyst employed is of acknowledged standing.

5. That the benefits of the grant apply only to analyses made for farmers, and that these subscribe towards the expenses of the association, subject to the exception in No. 2.

6. That each analysis represents at least one ton of bulk actually purchased and delivered to one or more members under guarantee, or at a specified price per unit of valuable ingredients.

7. That the analysis has been made from a sample drawn after delivery, in accordance with the published instructions of the Society, and that a sealed duplicate sample has been retained.

8. That all analyses are reported according to forms furnished by the Highland and Agricultural Society, and that valuations of manures, if any are made, are calculated on a uniform standard to be issued periodically by the Society, and at least once a-year.

¹ A partial analysis is one in which only one important constituent has been determined by the chemist or guaranteed by the seller.

III. (a) A general report regarding the analyses for which the Society has contributed payment is submitted to the general meeting in January, and full details concerning manures and feeding stuffs whose analyses show any of the valuable constituents to be deficient to the extent of one-tenth of the amount guaranteed, or whose total deficiencies represent as much as one-tenth of the value of the manure or feeding stuff, are published in the 'Transactions.'

(b) In the case of every analysis showing the deficiency above described, the secretary of the association must obtain confirmation of the deficiency from the chemist. The deficiency having been confirmed, the duplicate sample must be forwarded to the Secretary of the Highland and Agricultural Society. A copy of the analysis must at once be sent to the seller, and any explanations received from him forwarded in due course to the Secretary of the Highland and Agricultural Society.

(c) Should the seller be dissatisfied with the results obtained by the analyst of the association, a further analysis may, at his option, be made from the duplicate sample by another analyst to be chosen by the Society, and at its cost if the further analysis exonerates the seller; if otherwise, at the seller's cost.

IV. The report of each analysis for which a grant is claimed must be sent to the Secretary of the Highland and Agricultural Society on or before the 1st November of each year, written on a schedule issued by the Society, and accompanied by a form of guarantee (also issued by the Society), which must be filled up and signed by the seller.

The schedules and guarantee forms are supplied by the Secretary of the Society on application, and no grant is given for any analysis whose schedule and guarantee form are not accurately filled up.

No grants will be given for analyses whose schedules are sent in later than 1st November.

The actual analytical reports of the association's analyst need not accompany the schedules, but must be forwarded if desired.

METHOD OF PROCEDURE TO BE FOLLOWED BY SECRETARIES AND MEMBERS OF ANALYTICAL ASSOCIATIONS APPLYING FOR GRANTS FROM THE HIGHLAND AND AGRICULTURAL SOCIETY.

1. When a member makes a purchase he must obtain from the seller an analytical guarantee, written and signed by the seller, upon a form supplied by the Society.

2. When the member receives delivery of the stuff bought, he must inform the seller of the time and place at which the samples are to be taken for analysis, so that he may have an opportunity of being present.

3. In sampling a manure or feeding stuff the Society's printed instructions for sampling must be strictly complied with.

4. The sample (if it is to be analysed) must be sent to the chemist within a week of the date of sampling, so that any deficiency may be immediately detected.

5. The chemist must be asked to send in his report of analysis within a fortnight after receiving the sample.

6. When an analysis shows the sample to be deficient to such an extent as to require investigation by the Society, the association's chemist must be asked to verify the accuracy of his analysis, and report the matter within a week.

7. When a deficiency has been confirmed the secretary of the association must immediately inform the seller thereof, and draw his attention to the provisions of Regulation III.

8. At the same time the duplicate sample must be sent to the Secretary

of the Highland and Agricultural Society, and along with it must be sent the schedule relating to the purchase, and also the guarantee form, both accurately filled up in every particular.

9. Any correspondence that may ensue with the seller or buyer must be forwarded to the Secretary of the Highland Society as soon as received, so that the Committee may be able to investigate the matter with full knowledge of all the details.

10. The schedules (accurately filled up) of all samples for which the association claims a grant, along with the signed guarantees appertaining to them, must be sent to the Secretary of the Highland and Agricultural Society on or before 1st November, or they will not be received.

MANURES—THEIR COMPOSITION AND CHARACTERISTICS.

Nitrate of Soda.—A most valuable nitrogenous manure. Perfectly soluble, and immediately available for the nourishment of the plant. Feebly retained by the soil. Rapidly goes down to the subsoil. When much nitrate of soda is frequently applied and unaccompanied by other manures, it causes the soil to be rapidly exhausted. Benefits deeply rooting plants.

Good samples contain 95 per cent or upwards of pure nitrate of soda, equivalent to about 19 per cent of ammonia.

Sulphate of Ammonia.—A more concentrated nitrogenous manure than the preceding. Perfectly soluble, but not so rapid in its action as nitrate of soda. It is somewhat firmly retained by the soil, and not so liable as nitrate of soda to be washed out by heavy rains. It is therefore more suitable than nitrate for wet districts.

Good samples contain 95 per cent or more of pure sulphate of ammonia, equivalent to from about 24½ to 25 per cent of ammonia.

Dried Blood.—A nitrogenous manure, which differs from the above in being insoluble. It must be decomposed in the soil before it yields up its nitrogen to the plant, and this it does only slowly. The nitrogen is in the form of albumen, and is capable of yielding from 12 to 16 per cent of ammonia.

Horn-dust—Keronikon.—An insoluble nitrogenous manure, capable of yielding 16 to 18 per cent of ammonia. Its efficacy as a manure increases in proportion as it is finely ground.

Horn, when in the form of chips or coarse shavings, decomposes extremely slowly, and is not suitable for application as a manure.

Shoddy or Wool-waste.—An insoluble nitrogenous material used by manure manufacturers as a source of ammonia in dissolved manures. It is capable of yielding from 5 to 14 per cent of ammonia. It is a useful manure when dissolved, but not otherwise.

Leather.—A very insoluble nitrogenous material, yielding about 9 per cent of ammonia, used by manure manufacturers after being melted and ground, but of little value until it has been dissolved.

Peruvian Guano.—A general manure formed of the excrements of fish-eating birds, and containing nitrogenous compounds, phosphates, and potash.

High-class Peruvian guano is rich in nitrogenous matter, a large proportion of which is soluble. As formerly imported, it was capable of yielding from 8 to 12 per cent ammonia, part of which was derived from ammonia salts, and part (less than 1 per cent) from nitrates. Phosphates were low, seldom exceeding 30 per cent, but from one-quarter to one-half of the phosphates were soluble. The amount of potash was usually from 3 to 5 per cent. Not now imported.

Low-class Peruvian guano, as now imported, is poor in nitrogenous

matter, yielding only from 3 to 5 per cent ammonia. The phosphates are correspondingly high—viz., from 30 to 50 per cent—but the proportion of soluble phosphate is much smaller than in high-class Peruvian guano. Potash occurs to a very small extent, viz., about 1 to 3 per cent.

Low-class guanos are formed originally from high-class guanos, by the washing out of soluble constituents by rain, &c., and their composition varies greatly according to the amount of washing they have undergone.

Genuine Peruvian guano frequently contains a large proportion of stony insoluble matter.

Fortified Peruvian Guano,—also called by various names, such as *improved*, *equalised*, &c.—Such guanos are mixtures, with low-class Peruvian guano for a basis. Sulphate of ammonia is added, and perhaps also other nitrogenous matter, to bring them up to the guaranteed analysis, say from 8 to 10 per cent ammonia.

Dissolved Peruvian Guano.—This is usually Peruvian guano dissolved in sulphuric acid, and fortified with sulphate of ammonia so as to make a strong, active manure.

Ichaboe Guano.—A true guano, but of recent formation. It is very rich in nitrogenous matter, which yields from 10 to 16 per cent of ammonia, but a large part of the nitrogenous matter is in the form of feathers, which are insoluble and of low manurial value, otherwise it resembles high-class Peruvian guano. The total phosphates vary from 18 to 30 per cent, of which from a fourth to a half is usually soluble. There is seldom more than 2 per cent potash present.

Fish Guano.—Derived from fish-curing yards, and consisting of the heads and offal of fish, dried and ground. Properly speaking, it is not a guano. The name guano is properly applied only to the dung of birds and some other animals.

High-class fish guano contains nitrogenous matter, yielding from 10 to 12 per cent of ammonia, but it is in the form of insoluble albuminous compounds, which only very slowly decompose and become available as plant food. The phosphates range from 18 to 30 per cent, and are all insoluble.

Low-class fish guanos are substances like the preceding, but containing less nitrogenous matter and more phosphates. They are simply fish-bone manures, with somewhat more ammonia and less phosphate than ordinary bone-meal, and having no real resemblance to a guano.

Fish guanos are usually impregnated with fish-oil, which detracts from the value of the manure. The oil should not exceed 3 per cent.

Frey-Bentos Guano.—The dried and ground residue and *débris* of animals after the extraction of "Liebig's Extract." It is not a guano. There are various grades of this manure. One contains much bone matter, another a good deal of horn. They are slow manures. The best manure is derived from muscular fibre, yielding about 14 per cent ammonia and about 5 per cent phosphate. It is a strong nitrogenous manure, variously named.

Bone-meal.—Chiefly a phosphatic manure, but containing also nitrogenous matter. Phosphates range from 44 to 55 per cent, according to the purity of the bones, and are insoluble. The nitrogenous matter is capable of yielding from 4 to 5 per cent ammonia, and is also insoluble. The higher the phosphates the lower the ammonia, and *vice versa*. The finer ground it is the more speedy is its action.

Bone-dust.—A coarser ground bone than the preceding.

Crushed Bones.—Still coarser ground.

Steamed Bone Flour.—Bones which have been subjected to steam at high pressure for the extraction of glue or gelatine. The residue contains, from 56 to 65 per cent phosphates, and from 1 to 2 per cent ammonia. It is white-coloured and friable, and can be crushed with the hand. It is able to be, and ought to be, ground to a fine flour.

Pure Dissolved Bones.—Bones dissolved in sulphuric acid. It contains usually less than 20 per cent soluble phosphate, about 10 to 15 per cent of insoluble phosphate, and yields about $3\frac{1}{2}$ per cent ammonia.

Pure Vitriolated Bones.—Bones which have been moistened with sulphuric acid, and thereafter allowed to heat in large heaps. It contains less soluble phosphate and more ammonia than the preceding, and is usually made from more coarsely ground bones.

Dissolved Bone Manures.—These are compound manures, consisting of any mixture of phosphatic and nitrogenous materials which can be dissolved, with some admixture of bone, so as to produce a manure containing from 15 to 30 per cent soluble phosphates, and from 1 to 3 per cent ammonia. *Dissolved bone manures* frequently contain some bone material that has not been dissolved.

Superphosphates.—Phosphates dissolved with sulphuric acid. Their composition varies according to the richness of the phosphate from which they are made, and the extent to which they have been dissolved. If mixed with nitrate of soda, except in very small quantity, it causes loss from escape of nitrous fumes, which are injurious when breathed.

High-class superphosphates are made from phosphates containing a high percentage of phosphate of lime, and are very thoroughly dissolved. They should contain between 35 and 40 per cent soluble phosphate.

Low-class superphosphates usually contain 26 to 28 per cent soluble phosphate.

Mineral Phosphates exist in great variety, and contain very various proportions of phosphate of lime, viz., from 20 to 90 per cent. They are of use as manures only when they are ground to the finest flour.

Thomas-Slag, Basic Cinder, or Slag Phosphate Meal.—A substance obtained as a waste product in the dephosphorising of steel. It contains from 30 to 40 per cent phosphate of lime, and is manufactured into a powder of extreme fineness, 80 per cent at least passing through No. 100 wire-cloth. It is more soluble and available for plant-food than ground mineral phosphates. It may be mixed with nitrate of soda, but *not with sulphate of ammonia*.

Compound Manures.—These are general manures containing nitrogenous matter, phosphates, and potash, and their value depends not only on the amounts of these constituents, but also on their fineness of division, their solubility, and the sources from which their ingredients are derived.

The general character of a few of the more common of these may be indicated thus :—

Turnip Compounds.—These usually contain from 25 to 35 per cent phosphates, of which the half or more is soluble, and nitrogenous matter, capable of yielding from 2 to 5 per cent of ammonia, and sometimes 1 or 2 per cent of potash.

Potato Compounds.—These are somewhat like the preceding, but contain usually less phosphate and a little more ammonia (from 4 to 8 per cent) ; sometimes they contain no potash, but more frequently about 3 or 4 per cent is present, and in some instances twice as much.

Bean Compounds.—These may contain from 10 to 20 per cent phosphates, nitrogenous matter yielding from 2 to 4 per cent of ammonia, and usually a considerable proportion of potash, often as much as from 10 to 20 per cent.

Cereal Compounds.—These usually contain about 20 per cent phosphates, mostly soluble, and nitrogenous matter, partly as nitrates, yielding from 3 to 8 per cent ammonia, and they may also contain potash.

Grass Compounds.—These are somewhat like the preceding, but may contain less phosphates and more nitrogen, part of which is usually in the form of nitrate.

NOTES REGARDING ANALYSES OF MANURES.

The three ingredients of greatest importance in manures are phosphoric acid, nitrogen, and potash.

1. PHOSPHORIC ACID is present in manures as such, and also as phosphates of lime, magnesia, iron, and alumina.

Phosphate of Lime is most important, and exists in two states, insoluble and soluble.

Insoluble—

Insoluble phosphate of lime, called also	} contains about 46
Tricalcic phosphate, and	
Tribasic phosphate of lime,	
	per cent phosphoric acid.

Soluble—

Soluble phosphate of lime, called also	} contains about 61
Monocalcic phosphate of lime, and <i>erroneously</i>	
Monobasic phosphate of lime,	
	per cent phosphoric acid.

Some analysts prefer to state the soluble phosphate as

Biphosphate of lime, called also	} contains about 72
Monobasic phosphate,	
	per cent phosphoric acid.

The soluble phosphates are usually stated as equivalent to so much tricalcic or insoluble phosphate.

Soluble phosphate, multiplied by $1\frac{1}{2}$	} gives the equivalent of
Biphosphate, " " $1\frac{1}{2}$	
	tricalcic phosphate nearly.

Much confusion has arisen from the various methods of stating soluble phosphate. To escape from this confusion, it has now become the custom to consider the term "soluble phosphate" to mean "phosphate of lime rendered soluble." IN OTHER WORDS, SOLUBLE PHOSPHATE MEANS THE INSOLUBLE PHOSPHATE FROM WHICH IT WAS DERIVED.

Phosphate of magnesia occurs in small quantity in bones, &c., and is usually reckoned as tricalcic phosphate.

Phosphates of iron and alumina, when occurring in *small quantity*, are usually reckoned as tricalcic phosphate, but if the quantity is considerable it should be separately estimated.

2. NITROGEN occurs in manures mostly in three forms—Ammonia salts, nitrates, and albuminoid matter.

Ammonia sulphate (pure), contains $25\frac{3}{4}$ per cent ammonia.

Ammonium chloride (pure), " $31\frac{1}{4}$ " "

Nitrate of soda (pure), contains nitrogen equal to 20 per cent ammonia.

Albuminoid matter contains from 14 to 16 per cent nitrogen, equal to from 17 to 19 per cent ammonia, most of which sooner or later becomes available as plant-food.

3. POTASH occurs mostly in the form of soluble salts, and should be reckoned as anhydrous potash (K_2O).

Sulphate of potash (pure), contains potassium = 54 per cent anhydrous potash.

Muriate of potash (pure), contains potassium = fully 63 per cent anhydrous potash.

FEEDING STUFFS—THEIR COMPOSITION AND CHARACTERISTICS.

- These are concentrated forms of fodder, whose value depends upon their *albuminoid matter, oil, and carbohydrates* (such as starch and sugar).
- LINSEED** (seed of *Linum usitatissimum*, Common Flax).—Bombay seed large and pale; Baltic seed smaller and dark brown, more liable to impurities than Bombay seed; should be crushed and plotted before feeding. Useful in calf fodders, also for milk-giving, and in the last stage of masting. Quantity, 1 to 3 lb. per 1000 lb. L.W.
- LINSEED-CAKE**.—Much approved feeding cake; merits well known. Home-made cake usually softer and more oily than foreign. Very hard-pressed cake should be avoided, as it is low in oil, and not easily digested. Linseed-cakes usually impure. Chief impurities, rape-cake and locust-beans, less frequently chaff, and weed-seeds from badly screened seed. Should be broken to small pieces before feeding. Quantity, 2 to 6 lb. per 1000 lb. L.W.
- RAPE-CAKE** (seed of *Brassica napus* and *B. campestris*).—It has a greenish mottled appearance and a bitter taste, which renders it distasteful to cattle at first. Should be given in small quantity to begin with. Not suited for calves. When given to milch cows, the quantity should not exceed 2 or 3 lb. per head per day, or it will give a disagreeable taste to milk and butter. Sometimes very impure. A dangerous impurity is mustard-seed. May be detected by steeping in cold water for some hours, and noting smell of mustard. Danger may be avoided by steeping the ground cake in *boiling* water.
- POPPY-CAKE** (seed of *Papaver somniferum*).—Contains a savoury and easily digestible oil. May be fed to cattle in considerable quantity—5 to 8 lb. per head per day. More than 5 lb. per head per day to milch cows detracts from flavour of butter.
- HEMP-CAKE** (seed of *Cannabis sativa*).—Not much used for feeding. Not so digestible as the above, owing to abundance of woody fibre (25 per cent). Fed chiefly to horses and sheep. To milch cows not more than 1 lb. per head per day. Apt to grow mouldy in summer.
- SUNFLOWER-CAKE** (seed of *Helianthus annuus*).—Relished by stock, and well digested.
- COTTON-CAKE** (seed of *Gossypium hirsutum*, &c.) *Uncorticated*.—Best quality from Egyptian and Sea Island seed. Inferior qualities are woolly, and to be avoided. Husk has astringent properties, and is a good cure for *scour*. Should be ground to the size of linseed. Not very digestible, owing to abundance of woody fibre (28 per cent). Should be used freshly made, because liable to mould on keeping.
- Decorticated*—viz., cotton-cake deprived of the husk.—A very concentrated and powerful bye-fodder. Should be given with caution, crushed fine, and mixed with Indian corn, oats, or other farinaceous food. Large quantity is injurious, and may even be fatal. Very variable in composition. Frequently very hard pressed, and therefore indigestible. When freshly made, softly pressed, and of good quality, it is a valuable bye-fodder. Oil very bland and digestible; used to adulterate olive-oil.
- SESAME-CAKE** (seed of *Sesamum orientale*).—Seed imported from India. Excellent bye-fodder, easily digested, much relished by all kinds of stock. Favourable for milk-giving, and also for masting. Oil bland and digestible, and much in favour for making margarine.
- RICE-MEAL** (seed of *Oryza sativa*).—The meal is a bye-product obtained in preparing rice for the market. A very good, safe, and acceptable fodder, but less concentrated than ordinary oilcakes. Varies very

much in quality, and frequently adulterated with meal derived from rice husks. Much relished by stock, and useful for milch cows as well as for fattening animals.

RYE-MEAL.—Is the bran of rye, and rather more concentrated than wheat bran. It is very good fodder for cattle and sheep, but not for horses.

PALM-KERNEL CAKE.—An excellent, palatable, and easily digested bye-fodder. Especially good for milch cows. Increases the proportion of fat in milk. Puts a finish upon fattening stock. When ground to powder and most of the oil extracted, it is sold as *Palm-kernel meal*, a much relished and digestible bye-fodder. A useful addition to calf-meals.

FLESH-MEAL.—Residue obtained in the manufacture of *Liebig's Extract of Beef*. A highly nitrogenous bye-fodder, most suitable for enriching a too farinaceous dietary, such as potatoes. Much used in that way as a swine fodder. Easily digested, and readily accepted by cattle.

FISH-MEAL.—Bye-product of fish-curing yards, made chiefly from the heads of cod and tusk. Resembling fish guano in composition, but somewhat variable. Highly phosphatic, and therefore useful as a bye-fodder to young growing cattle. Ratio, from 1 to 3 lb. per head per day.

HERRING-MEAL.—A very oily fodder, useful as an adjunct to the dietary of milch cows. Quantity, 1 to 6 lb. per head per day.

LOCUST-BEANS—*Carob Bean*.—A sugary fodder, most palatable and acceptable to all kinds of stock. Used to mix with oilcakes and meals, so as to improve their flavour.

DRIED GRAINS.—The draff from distilleries and breweries dried so as to contain only about 10 per cent water. It is a first-class feeding stuff if of good quality, but the qualities differ considerably.

THE COMPOSITION OF FEEDING STUFFS.

The following is the average composition of genuine cakes and meals in common use:—

	Albuminoids.	Oil.	Carbohydrates.
Linseed-cake . . .	29	11	32
Rape-cake . . .	31	10	30
Poppy-cake . . .	35	10	22
Hemp-cake . . .	30	8½	17
Sunflower-cake . . .	33	9	27
Cotton-cake . . .	28	7½	30
„ (decorticated)	44	15	20
Sesame-cake . . .	37	13	21
Rice-meal . . .	11	10	50
Paisley meal . . .	15	9	60
Rye-meal . . .	14.5	3.5	60
Bran . . .	13.5	3.5	56
Palm-kernel cake . . .	17	10	41
Palm-kernel meal . . .	19	3½	44
Flesh-meal . . .	71	13	...
Fish-meal . . .	50	4	...
Herring-meal . . .	40	20	...
Locust-bean meal . . .	4	2	74
Linseed . . .	21	37	20
Dried grains . . .	20	8	50

USEFUL FACTORS.

Amount of	Multiplied by	Gives corresponding amount of
Nitrogen	1.214	Ammonia.
"	6.3	Albuminoid matter.
Ammonia	3.882	Sulphate of ammonia.
"	3.147	Muriate of ammonia.
"	3.706	Nitric acid.
"	5.0	Nitrate of soda.
Potash (anhydrous)	1.85	Sulphate of potash.
"	1.585	Muriate of potash.
Phosphoric acid (anhydrous)	2.183	Phosphate of lime. ¹
" "	1.4	Biphosphate.
" "	1.648	Soluble phosphate (monocalcic tribasic).
Soluble phosphate ²	1.325	Phosphate of lime.
Biphosphate	1.566	"
Lime	1.845	"
"	1.786	Carbonate of lime.

The following are the forms in which analyses of *ordinary genuine* manures and feeding stuffs are usually reported :—

I. REPORTS OF ANALYSES OF *MANURES*.

(On the left side are the analytical details which may vary in form, and on the right the valuable constituents which must not vary in form, and which alone are considered in estimating the value of manure.)

1. Form of Analysis for SUPERPHOSPHATES, DISSOLVED BONES, and the like.

Phosphoric acid, soluble	<i>Capable of yielding as valuable constituents.</i>	
Do., in an insoluble state.....	Phosphates of lime dissolved	}
Lime	Do. do. undissolved	
Sulphuric acid, organic }		
matter, &c.		
Sand and insoluble matter.....	Ammonia . . . . .	.....

2. Form of Analysis for BONES, BONE-MEAL, FISH GUANO, and the like.

Phosphoric acid	<i>Capable of yielding as valuable constituents.</i>	
Lime	Phosphate of lime . . . . .	.....
Alkalies, &c.		
Organic matter	Ammonia . . . . .	.....
Moisture		
Sand and insoluble matter.....		

¹ By phosphate of lime is meant tricalcic phosphate (3CaO , P_2O_5).

² Monocalcic tribasic phosphate (CaO , $2\text{H}_2\text{O}$, P_2O_5).

3. Form of Analysis for MIXED MANURES, PERUVIAN and ICHABOE GUANOS, and the like.

	<i>Capable of yielding as valuable constituents.</i>
Phosphoric acid, soluble	Phosphate of lime dissolved
Do., in an insoluble state	Do. do. undissolved }
Lime	
Alkalies, &c.	Potash
Organic and volatile matter	Total nitrogen, = ammonia
Moisture	
Sand and insoluble matter....	

II. REPORTS OF ANALYSES OF *FEEDING STUFFS*.

<i>Valuable</i>	{	Albuminoid compounds	= Nitrogen
<i>Constituents</i>		Oil	
		Carbohydrates	
		Woody fibre	
		Moisture	
		Ash	

FORMS OF GUARANTEE.

GUARANTEE OF MANURE.

I guarantee that the manure called.....and sold by me to
.....contains a minimum of—

Soluble phosphoric acid = Phosphate of lime dissolved.....per cent.
Insoluble phosphoric acid = Phosphate of lime undissolved.....per cent.
Potash salts . . . = Potash (K_2O) per cent.
Total nitrogen . . . = Ammonia per cent.

Signature of seller.....

Date.....18...

GUARANTEE OF FEEDING STUFF.

I guarantee that the feeding stuff called.....and sold by me to
.....contains a minimum of—

..... per cent albuminoids,
 per cent oil.
 per cent carbohydrates.

Signature of seller.....

Date.....18...

LOCAL ANALYTICAL ASSOCIATIONS WHO HAVE RECEIVED THE SOCIETY'S GRANTS.

	County.	Name of Association.	Name and Address of Secretary.	Number of Analyses.					Grants obtained.			
				1887. 1888. 1889. 1890.					1887. 1888. 1889. 1890.			
				1887.	1888.	1889.	1890.	1887.	1888.	1889.	1890.	
1	Aberdeen	Alford Analytical Association	C. M'Connach, Cairnhalloch, Alford	15	12	19	18	£6 15 0	£5 5 0	£8 5 0	£7 15 0	
2	"	Buchan Farmers' Analytical Association	Thomas Forrest, Mains of Ludquharn, Longside	10	16	10	11	4 10 0	7 5 0	4 10 0	4 10 0	
3	"	Turriff Analytical Association	James Beattie, Gordonstown, Rothiemoran	23	26	32	16	10 15 0	10 15 0	15 0 0	6 15 0	
4	Ayr	Galston and Loudoun Farmers' Analytical Association	Alex. Goldie, Irvine Bank House, Darvel	..	4	4	3	2 0 0	2 0 0	2 0 0	1 10 0	
5	"	Grougar Farmers' Analytical Assoc.	R. Whyte, East Raws, Kilmarnock	4	4	3	4	1 10 0	1 10 0	1 0 0	1 10 0	
6	Argyll	Kintyre Farmers' Analytical Assoc.	R. Dickie, Kileonan, Campbelltown	4	5	7	9	1 5 0	1 10 0	2 5 0	3 5 0	
7	Caithness	Caithness Farmers' Analytical Assoc.	G. Brown, Watten Mains, Caithness	..	..	..	..	..	..	1 15 0	2 0 0	
8	Dumfries	Annandale Farmers' Club	J. & J. Baird and J. Mackenzie, Lockerbie	..	..	5	4	..	..	..	..	
9	Elgin	Morayshire Analytical Assoc.	R. Barclay Gordon, 73 High St., Elgin	..	..	10	9	..	..	4 10 0	3 15 0	
10	Forfar	Arbroath Analytical Association	James Kydd, Seryne, Carnoustie	19	8	23	31	8 10 0	3 15 0	9 0 0	14 0 0	
11	"	Carise of Gowrie Farmers' Analytical Association	A. Anderson, Berryhill, Dundee	12	..	10	11	5 5 0	..	4 0 0	5 5 0	
12	"	Kirriemuir Analytical Association	Andrew Osler, Kintyre, Kirriemuir	..	12	..	4	..	5 5 0	..	1 10 0	
13	Inverness	Inverness Farmers' Society	William Ross, Seafield of Raigmore, Inverness	..	..	..	..	..	..	..	..	
14	Kincardine	Kincardineshire Farmers' Club	A. B. Annandale, Stonehaven	15	15	21	17	6 5 0	7 0 0	9 15 0	7 15 0	
15	Kirkcubright	Kirkcubright Analytical Association	R. Sproat, Lennox Plunton, Kirkcubright	..	..	..	..	..	..	..	..	
16	Lanark	Lanarkshire Analytical Association	J. Lindsay, Eastfield, Thankerton	20	16	15	19	7 15 0	6 15 0	6 0 0	6 15 0	
17	"	Avonshire Farmers' Analytical Assoc.	John Paterson, Torfoot, Strathaven	7	7	..	4	2 15 0	2 10 0	..	1 5 0	
18	Nairn	Nairnshire Analytical Association	J. S. Robertson, Cawdor Estate Office, Nairn	..	..	16	11	..	..	6 15 0	4 15 0	
19	Orkney	Orkney Agricultural Society	Jas. Johnston, Orphir House, Orphir	..	12	12	2	9 10 0	5 10 0	5 10 0	1 0 0	
20	Perth	Strathern Analytical Association	B. Carruthers, Lawhill, Auchtermarder	23	..	23	6	2 15 0	..	8 15 0	2 15 0	
21	Ross	Eastern Ross Analytical Association	John Gordon, Culisse, Nigg	9	..	23	..	..	..	12 10 0	5 0 0	
22	"	Western Ross Analytical Assoc.	Walter Arras, Fodderty Lodge, Dingwall	19	29	32	14	8 0 0	11 0 0	12 10 0	5 0 0	
23	Roxburgh	Kelso Analytical Association	Alex. Pott Stevenson, Kelso	36	18	12	5	14 15 0	7 15 0	4 15 0	2 0 0	
24	Wig'town	Stoneykirk Analytical Association	James Hunter, Culgroat, Stranraer	..	..	4	10	..	..	1 10 0	4 5 0	
				216	184	257	208	92 5 0	77 15 0	107 15 0	87 5 0	

UNITS TO BE USED IN DETERMINING THE COMMERCIAL VALUE OF MANURES.¹

Terms—CASH, including Bags gross weight—not including Carriage.

N.B.—These units are based on the present RETAIL PRICES at port. When these units are multiplied by the percentages in the analysis of a Manure, they will produce a value representing very nearly the cash price at which one SINGLE TON may be bought in fine sowable condition. Larger purchases may be made on more favourable terms.

For Season 1891.

Items to be Valued.	Guanos.		Scrap Manures.		Bone-Meal.			Steamed Bone Flour.	Dissolved or Vitriolated Bones.	Superphosphates.	Dissolved Compounds.			
	Ichaboe.	Peruvian (Riddled).	Fish Guano.	Frey-Bentos Guano.							From	To	Average.	
Classes		Genuine.		a.	b.	a.	b.	c.	a.					
Phosphates dissolved	dis-	..	..	..	..	..	..	..	..	3/3	2/6	2/6	3/3	2/10
Phosphates undissolved	un-	2/6	2/2	1/6	1/6	1/10	1/9	1/8	1/9	1/9	..	1/6	2/3	1/9
Ammonia	..	17/6	16/-	12/-	15/-	12/6	11/-	10/6	10/-	12/-	13/-	..	11/-	16/-
Potash	..	..	3/6	..	..	..	..	..	..	..	..	..	4/-	4/3

CLASSIFICATION OF MANURES.

Fish guano . . .	Finely ground, and containing not more than 3 per cent oil.
Frey-Bentos guano . . .	{ (a) Meat-meal, free from horn, yielding over 13 per cent ammonia. (b) Mixed scrap, yielding 7 to 8 per cent ammonia, and 30 to 40 per cent phosphates.
Bone-meal . . .	{ (a) 90 per cent passing $\frac{1}{4}$ -inch sieve. (b) 90 per cent passing $\frac{1}{2}$ -inch sieve. (c) Coarser. Genuine bone-meal contains from 45 per cent to 55 per cent phosphates, and from 4 per cent to 5 per cent ammonia.
Steamed bone flour . . .	{ Bones degelatinised and ground to flour containing about 60 per cent phosphates, and about 2 per cent ammonia.
Pure dissolved bones . . .	Containing nothing but natural bones and sulphuric acid.
Dissolved compounds	{ Including dissolved-bone manures and all special manures consisting of ingredients mixed together and dissolved as a whole. The "Average" units should be used in valuing ordinary well-made dissolved compounds. If the manure is of superior manufacture and of high concentration, the units used should be above the average; if of inferior manufacture, or of low concentration, the units used should be below average. In valuing such manures for Associations, the units employed must be specified.
Mixtures . . .	{ To be valued according to the unit values (as given above) of the ingredients of which they are guaranteed and also found to be composed, with an addition of from 5 to 10 per cent, according to the fineness of their manufacture.

Local Analytical Associations receiving grants from the Society must not use other units than these in valuing manures.

¹ See note, p. 43.

CASH PRICES (FEBRUARY).

MANURES.			
	Guarantee.	Price per Ton.	Unit.
Sulphate of ammonia, 97 per cent	Per cent. 24 Am.	£ s. d. 12 0 0	Am. = 10/
Nitrate of soda, 95 per cent	10 "	8 10 0	" = 9/
Meat-meal (Liebig's)	13 "	10 10 0	" = 15/
Castor-cake dust	5.5 "	3 15 0	" = 13/6
Horn-dust	15 "	9 0 0	" = 12/
Dried blood	15 "	9 0 0	" = 12/
Muriate of potash, 80 per cent	50 Pot.	8 15 0	Pot. = 3/5
Sulphate of potash, 50 per cent	27 "	5 15 0	" = 4/3
Kainit	12 "	2 10 0	" = 4/3
Nitrate of potash, 73 per cent	{ 14 Am. 40 Pot.	} 14 12 6 {	Am. = 12/6
			Pot. = 4/
Ground Charleston phos.	57 Phos.	4 0 0	Phos. = 1/5
Belgian phosphate	50 "	2 15 0	" = 1/1
Thomas-slag (fine) Scotch	..	2 0 0	" = 1/3
" " " English	37 "	2 5 0	" = 1/3

FEEDING STUFFS.				Price per Ton in bags.
	Analyses.			
	Album.	Oil.	Carbo- hydrates.	
Linseed-cake	28	10	35	£ s. d. 8 5 0
Decorticated cotton-cake	45	8	20	6 10 0
Undecorticated do.	24	7	25	5 0 0
Hemp-cake (broken)	28	9	17	4 15 0
Rape-cake	32	10	27	5 15 0
Bean-meal	25	2	50	7 0 0
Locust-bean meal	6	2	70	6 10 0
Dried grains	20	8	50	4 10 0
Indian corn	10	5	55	6 10 0
Paisley meal	15	9	60	5 5 0
Linseed (whole)	20	35	14	13 10 0
Linseed-oil	..	..	..	23 0 0
Molasses	..	..	..	6 0 0

INSTRUCTIONS FOR VALUING MANURES.

The commercial values of manures are determined by means of the UNITS in the following manner:—

Take the analysis of the manure, and look for the following substances:—

Phosphates dissolved (or soluble phosphate)	} No other items but these are to be valued.
" undissolved (or insoluble ")	
Ammonia	
Potash	

Should the analysis or the guarantee not be expressed in that way, the chemist or the seller should be asked to state the quantities in these terms.

Suppose the manure is bone-meal:—

There are three classes of bones, according to their fineness. An ordinary bone-meal will fall under Class (b), and it will contain about 50 per cent phosphate, and $4\frac{1}{2}$ per cent ammonia. The units for bones, Class (b), are 1s. 9d. for insoluble phosphate, and 10s. 6d. for ammonia. Therefore the value is—

Insol. phosphate, 50 times 1s. 9d., equal to	£4	7	6
Ammonia, $4\frac{1}{2}$ " 10s. 6d. "	2	7	3
Say	£6	14	0 per ton.

Suppose the manure is dissolved or vitriolated bones:—

It must be guaranteed "pure."

The units in the Schedule are 3s. 3d. for soluble phosphate, 1s. 9d. for insoluble phosphate, and 13s. for ammonia.

The analysis will be about 15 per cent soluble phosphate, 20 per cent insoluble phosphate, and 3 per cent ammonia. In that case the value would be—

Sol. phosphate, 15 times 3s. 3d., equal to	£2	8	9
Insol. " 20 " 1s. 9d. "	1	15	0
Ammonia, 3 " 13s. "	1	19	0
Say	£6	2	0 per ton.

Suppose the manure is a superphosphate,—say an ordinary superphosphate, with 27 per cent soluble phosphate and 3 per cent insoluble phosphate. It is valued thus—

Sol. phosphate, 27 times 2s. 6d., equal to, say, £3 7 6 per ton.
Insoluble phosphate is not valued in a superphosphate.

Suppose the manure is a dissolved compound, such as *dissolved-bone manures*, or a special manure, such as a *turnip or potato manure*, it will be valued according to the units under "Dissolved Compounds," the *average* units for which are 2s. 10d. for soluble phosphate, 1s. 9d. for insoluble phosphate, 13s. for ammonia, and 4s. for potash, in the Schedule. Thus, an ordinary turnip manure containing 20 per cent soluble phosphate, 10 per cent insoluble phosphate, 4 per cent ammonia, and 2 per cent potash, would be valued thus—

Sol. phosphate, 20 times 2s. 10d., equal to	£2	16	10
Insol. do., 10 " 1s. 9d., "	0	17	6
Ammonia, 4 " 12s. 6d., "	2	10	0
Potash, 2 " 4s. "	0	8	0
Say	£6	12	0 per ton.

Note.—The units have reference solely to the COMMERCIAL VALUES of Manures, and not to their AGRICULTURAL VALUES.

Thus, in stating soluble phosphate in dissolved bones at 3s. 3d. per unit, and that in superphosphate at 2s. 6d., it is meant that these are the prices per unit at which soluble phosphate can be bought in these two manures; but it does not mean that the soluble phosphate in the one is 9d. per unit better as a manure than that in the other. It is probably no better.

BOTANICAL DEPARTMENT.

Consulting Botanist to the Society—A. N. M'ALPINE, Minto House, Chambers Street, Edinburgh.

The Society have fixed the following rates of charge for the examination of plants and seeds for the *bona fide* and individual use and information of members of the Society (not being seedsmen), who are particularly requested, when applying to the Consulting Botanist, to mention the kind of examination they require, and to quote its number in the subjoined schedule. The charge for examination must be paid at the time of application, and the carriage of all parcels must be prepaid.

Scale of Charges.

1. A report on the purity, amount, and nature of foreign materials, 2s.
2. On the germinating power of a sample of seed, 2s.
3. Determination of the species of any weed or other plant, or of any vegetable parasite, with a report on its habits and the means for its extermination or prevention, 5s.
4. Report on any disease affecting farm crops, 5s.
5. Determination of the species of any natural grass or fodder plant, with a report on its habits and pasture or feeding value, 1s.

The Consulting Botanist's Reports are furnished to enable members—purchasers of seeds and corn for agricultural purposes—to test the value of what they buy, and are not to be used or made available for advertising or trade purposes by seedsmen or otherwise.

Instructions for Selecting and Sending Samples.

In sending seed or corn for examination, the utmost care must be taken to secure a fair and honest sample. In the case of grass seeds, the sample would be drawn from the centre of the sack or bag, and in all cases from the bulk delivered to the purchaser. If anything supposed to be injurious or useless exists in the corn or seed selected, samples should also be sent.

When possible, at least one ounce of grass and other small seeds should be sent, and two ounces of cereals or larger seeds. The exact name under which the seed has been bought (but preferably, a copy of the invoice) should accompany the sample.

Grass seeds should be sent at least four weeks, and clover seeds two weeks, before they are to be used.

In collecting specimens of plants, the whole plant should be taken up and the earth shaken from the roots. If possible, the plants must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. Place them in a bottle, or pack them in tinfoil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

It is strongly recommended that members purchasing seeds should insist—

(1) Upon having from the seller a guarantee stating the purity and germination of the seed supplied.

(2) That the bulk be same as sample.

(3) That it contain not more than 5 per cent other than the species ordered.

If the purity and germination of the seed is not known, it is impossible to tell either its money value or the proper amount to be sown.

It is also strongly recommended that the purchase of prepared mixtures should be avoided, and the different seeds to be used should be purchased separately.

Parcels or letters containing seeds or plants for examination (carriage or postage paid) must be addressed to Professor M'Alpine, Botanical Laboratory, Minto House, Chambers Street, Edinburgh.

Grant for grass experiments in 1890, £30.

DAIRY DEPARTMENT.

The Society established in 1885 a Dairy Department, to promote the dairy interests.

During 1885, 1886, 1887, 1888, 1889, and 1890, the Society placed at the disposal of the Committee a sum of £100 to aid local efforts in the employment of itinerating Instructors and Demonstrators in Cheese and Butter making.

The grants have been appropriated among the different branches of the Scottish Dairy Associations as follows :—

Branch.	1887.	1888.	1889.	1890.
Ayrshire	£45 0 0	£37 0 0	...	...
Wigtownshire, Rhinns District	22 10 0	} 31 0 0	...	...
Wigtownshire, Lower District	...			
Kirkcudbright	10 0 0	22 0 0	...	...
Dumfriesshire	10 0 0	10 0 0	..	...
Upper Ward of Lanarkshire	10 0 0	...	...	...
Argyleshire	2 10 0	...	...	...
Kilmarnock Dairy School	...	...	£100 0 0	£100 0 0
	£100 0 0	£100 0 0	£100 0 0	£100 0 0

PREMIUMS.

GENERAL REGULATIONS FOR COMPETITORS.

1. It is to be distinctly understood that the Society is not responsible for the views, statements, or opinions of any of the writers whose papers are published in the 'Transactions.'

2. All reports must be legibly written, and on one side of the paper only; they must specify the number and subject of the Premium for which they are in competition; they must bear a distinguishing motto, and be accompanied by a sealed letter, similarly marked, containing the name and address of the reporter—initials must not be used.

3. No sealed letter, unless belonging to a report found entitled to at least one-half of the Premium offered, will be opened without the author's consent.

4. Reports for which a Premium, or one-half of it, has been awarded, become the property of the Society, and cannot be published in whole or in part, nor circulated in any manner, without the consent of the Directors. All other papers will be returned to the authors if applied for within twelve months.

5. When a report is unsatisfactory, the Society is not bound to award the whole or any part of a Premium.

6. All reports must be of a practical character, containing the results of the writer's own observation or experiment, and the special conditions attached to each Premium must be strictly fulfilled. General essays, and papers compiled from books, will not be rewarded. Weights and measurements must be indicated by the imperial standards.

7. The Directors, before awarding a Premium, shall have power to require the writer of any report to verify the statements made in it.

8. The decisions of the Board of Directors are final and conclusive as to all Premiums, whether for Reports or at General or District Shows; and it shall not be competent to raise any question or appeal touching such decisions before any other tribunal.

9. The Directors will welcome papers from any Contributor on any suitable subject not included in the Premium List; and if the topic and the treatment of it are both approved, the writer will be remunerated, and his paper published.

CLASS I.

REPORTS.

SECTION 1.—THE SCIENCE AND PRACTICE OF AGRICULTURE.

FOR APPROVED REPORTS.

1. On the results of experiments for fixing and retaining the volatile and soluble ingredients in Farmyard Manure—Twenty Sovereigns. To be lodged by 1st November in any year.

The Report must detail the treatment adopted to fix and retain these ingredients—the materials used for that purpose, and the quantity and cost thereof—comparative analyses of the manure with and without the treatment, and also a statement of the crops grown with manure and without such treatment, must be given by the Reporter. The experiments to have extended over at least two years and crops.

2. On the results of experiments for ascertaining the comparative value of Farmyard Manure obtained from cattle fed upon different varieties of food, by the application of such manure to farm crops—Twenty Sovereigns. To be lodged by 1st November in any year.

The Report must state the effects produced on two successive crops by the application of manure obtained from cattle fed on different sorts of food, such as turnips and straw alone; and turnips and straw, with an addition of oilcake, linseed, bean-meal, grain, or other substances. The animals should be as nearly as possible of the same age, weight, condition, and maturity, and each lot should receive daily the same quantity of litter; and, except as to the difference of food, they must be treated alike.

The preparation of the manure, by fermentation or otherwise, should be in every respect the same; and it is desirable that not less than two several experiments be made with each kind, and that the ground to which it is to be applied be as equal as possible in quality and condition.

3. On a practical and reliable method of adjusting Farm Rents, in accordance with fluctuations in the prices of Farm Produce. Premium—Fifteen Sovereigns. Reports to be lodged by 1st November 1891.

The object of the paper is to afford those landowners and tenants desiring to adopt the principle of "produce rents," reliable data upon which to base their calculations and carry the system into practice. The writer to set forth the advantages and disadvantages of the system of "produce rents."

4. On the best system of Farm Account Books—Ten Sovereigns. To be lodged by 1st November 1891.

The Report must embrace—1st, A complete system of account books for a large mixed husbandry farm, including day-book, labour account, crop and stock account, cash-book, ledger, and form of balance-sheet—with convenient provision for recording the labouring, manuring, and produce or stocking of each individual field. 2d, A more concise and simple system of accounts which might suffice for smaller holdings, or for farmers who will not take the trouble to keep a more elaborate series of books.

Example pages and entries to be given, with brief description of the working of the system.

5. On permanent Timothy-Grass Meadows—Ten Sovereigns. To be lodged by 1st November 1891.

The writer to give particulars of at least one instance where they have been successfully laid down.

6. On the most economical method of Feeding Farm Horses—Fifteen Sovereigns. To be lodged by 1st November 1891.

The writer must give the practice and experience of owners of horses.

7. On the profitable Breeding, Rearing, and Feeding of Pigs on farms and small holdings in Scotland. Premium—Ten Sovereigns. Reports to be lodged by 1st November 1891.

The writer to give information as to the characteristics of the various breeds of pigs suited for Scotland; and describe fully how the pigs should be housed, fed, and treated generally.

8. On the hardy and useful Herbaceous Plants of any country, where such climate exists as to induce the belief that the plants may be beneficially introduced into the cultivation of Scotland—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

Attention is particularly directed to the grains and grasses of China, Japan, the Islands of the Eastern Archipelago, the Himalaya country, the Falkland and South Sea Islands, California, and the high north-western district of America.

Reporters are required to give the generic and specific names of the plants treated of, with the authority for the same—together with the native names, so far as known; and to state the elevation of the locality and nature of the soil in which they are cultivated, or which they naturally inhabit, with their qualities or uses; and it is further requested that the descriptions be accompanied, in so far as possible, with specimens of the plants, and their fruit, seed, and other products.

9. On the comparative advantages of Fattening Cattle in stalls, courts, or covered yards—Twenty Sovereigns. To be lodged by 1st November in any year.

The Report must detail the comparative result of actual experiments. The same quantities and kinds of food must be used. Information is required as to the comparative expense of attendance, the cost of erecting

the buildings, and any other circumstances deserving of attention. The state of the weather during the experiment, in point of temperature and wetness, and the advantages or disadvantages of clipping cattle put up to feed, must be particularly noted and reported.

10. On experiments for ascertaining the actual addition of weight to growing or fattening Stock, by the use of different kinds of food—Twenty Sovereigns. To be lodged by 1st November in any year.

The attention of the experimenter is directed to turnips, carrots, beet, mangel-wurzel, potatoes, cabbage, as well as to beans, oats, barley, Indian corn, linseed, oilcake or rape-cake, and to the effect of warmth and proper ventilation, and the difference between food cooked and raw. The above roots and other kinds of food are merely suggested; competitors are neither restricted to them nor obliged to experiment on all of them.

When experiments are made with linseed and cake, attention should be paid to the comparative advantages, economically and otherwise, of the substance in these two states.

Before commencing the comparative experiments, the animals must be fed alike for some time previously.

The progress of different breeds may be compared. This will form an interesting experiment of itself, for Reports of which encouragement will be given.

N.B.—The experiments specified in the two previous subjects must be conducted over a period of not less than three months. No lot shall consist of fewer than four Cattle or ten Sheep. The animals selected should be of the same age, sex, and breed, and as nearly as possible of the same weight, condition, and maturity. The live weight before and after the experiment must be stated, and if killed, their dead weight and quantity of tallow.

11. On Dairy Management, giving the most approved systems of Butter and Cheese Making, the use of the Thermometer, and the best Dairy Utensils—Ten Sovereigns. To be lodged by 1st November 1891.

The Report must be thoroughly practical, and embrace the writer's own experience of butter and cheese making.

12. On the Comparative Feeding Value of Ensilage, alone or with other ordinary Farm produce—Fifteen Sovereigns. To be lodged by 1st February 1892.

The Report must detail the comparative result of actual experiments; and the same quantities and kinds of food must be used.

13. On Pasture Plants, indigenous or naturalised—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1891.

The writer to give the results of his experience regarding the suitability of pasture plants for cultivation on various classes of land, and in different conditions of situation and climate.

14. On any useful practice in Rural Economy adopted in other countries, and susceptible of being introduced with advantage into Scotland—The Gold Medal. To be lodged by 1st November in any year.

The purposes chiefly contemplated by the offer of this premium is to induce travellers to notice and record such particular practices as may seem calculated to benefit Scotland. The Report to be founded on personal observation.

SECTION 2.—ESTATE IMPROVEMENTS.

FOR APPROVED REPORTS.

1. By the Proprietor in Scotland who shall have executed the most judicious, successful, and extensive Improvement—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

Should the successful Report be written for the Proprietor by his resident factor or farm manager, a Minor Gold Medal will be awarded to the writer in addition to the Gold Medal to the Proprietor.

The merits of the Report will not be determined so much by the mere extent of the improvements, as by their character and relation to the size of the property. The improvements may comprise reclaiming, draining, enclosing, planting, road-making, building, and all other operations proper to landed estates. The period within which the operations may have been conducted is not limited, except that it must not exceed the term of the Reporter's proprietorship.

2. By the Proprietor in Scotland who shall have erected on his estate the most approved Farm-buildings—The Gold Medal. Reports, Plans, and Specifications to be lodged by 1st November in any year.

3. By the Proprietor or Tenant in Scotland who shall have reclaimed within the ten preceding years not less than forty acres of Waste Land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

4. By the Tenant in Scotland who shall have reclaimed within the ten preceding years not less than twenty acres of Waste Land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

5. By the Tenant in Scotland who shall have reclaimed not less than ten acres within a similar period—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The Reports in competition for Nos. 3, 4, and 5 may comprehend such general observations on the improvement of waste lands as the writer's experience may lead him to make, but must refer especially to the lands reclaimed—to the nature of the soil—the previous state and probable value of the subject—the obstacles opposed to its improvement—the details of the various operations—the mode of cultivation adopted—and the produce and value of the crops produced. As the required extent cannot be made up of different patches of land, the improvement must have relation to one subject; it must be of profitable character, and a rotation of crops must have been concluded before the date of the Report. *A detailed statement of the expenditure and return and a certified measurement of the ground are requisite.*

6. By the Proprietor or Tenant in Scotland who shall have improved within the ten preceding years the Pasturage of not less than thirty acres, by means of top-dressing, draining, or otherwise, without tillage, in situations where tillage may be inexpedient—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

7. By the Tenant in Scotland who shall have improved not less than ten acres within a similar period—The Minor Gold Medal. To be lodged by 1st November in any year.

Reports in competition for Nos. 6 and 7 must state the particular mode of management adopted, the substances applied, the elevation and nature of the soil, its previous natural products, and the changes produced.

SECTION 3.—HIGHLAND INDUSTRIES AND FISHERIES.

FOR APPROVED REPORTS.

1. The best mode of treating native Wool; cleaning, carding, dyeing, spinning, knitting, and weaving by hand in the Highlands and Islands of Scotland—Five Sovereigns. To be lodged by 1st November 1891.

2. The best means of utilising the Sprat Fisheries—Five Sovereigns. To be lodged by 1st November 1891.

SECTION 4.—MACHINERY.

FOR APPROVED REPORTS.

On the advantages or disadvantages of using the American Chilled Plough in comparison with the old Scotch or Swing Plough—Ten Sovereigns. Reports to be lodged by 1st November 1891.

The Reporter must state the condition of the ground in spring after an autumn ploughing by both kinds of ploughs—the effect on after crops—comparative draught, and cost of working per acre.

SECTION 5.—FORESTRY DEPARTMENT.

FOR APPROVED REPORTS.

1. On Plantations of not less than eight years' standing formed on deep peat bog—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1891.

The premium is strictly applicable to deep peat or flow moss; the condition of the moss previous to planting, as well as at the date of the Report, should, if possible, be stated.

The Report must describe the mode and extent of the drainage, and the effect it has had in subsiding the moss—the trenching, levelling, or other preliminary operations that may have been performed on the surface—the mode of planting—kinds, sizes, and number of trees

planted per acre—and their relative progress and value, as compared with plantations of a similar age and description grown on other soils in the vicinity.

2. On the more extended introduction of hardy, useful, or ornamental Trees, which have not hitherto been generally cultivated in Scotland—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The Report should specify as distinctly as possible the kind of trees introduced. The adaptation of the trees for use or ornament, and their comparative progress, should be mentioned. Attention is directed to the introduction of any tree as a nurse in young plantations, which by growing rapidly for several years, and attaining maturity when at the height of 20 or 25 feet, might realise the advantage and avoid the evils of thick planting.

3. On the Life-History of any Insect or Tribe of Insects which is injurious to British Forest Trees (*e.g.*, *Scolytus destructor*, of the Elm)—Fifteen Sovereigns. To be lodged by 1st November 1891.

The means for guarding against or destroying these pests to be mentioned, and the Report to be illustrated by original drawings and specimens of the insect and its ravages.

The *Pine Beetle* and the *Fir Weevil* are excluded, having been already reported on.

CLASS II.

DISTRICT COMPETITIONS.

REGULATIONS 1891.

The Money Premiums and Medals awarded at District Competitions will be sent direct to the winners in January next. No payments must therefore be made by the Secretary or Treasurer of any local Association.

Grants in aid of DISTRICT COMPETITIONS for 1892 must be applied for before 1st November 1891, on Forms to be obtained from the Secretary.

When a Grant has expired, the District cannot apply again for aid for two years.

SECTION I.—GRANTS TO DISTRICT SOCIETIES FOR HORSES, CATTLE, SHEEP, AND PIGS.

1. CLASS OF STOCK—LIMIT OF GRANTS, £340.—The Highland and Agricultural Society will make Grants to District Societies to deal with, as in the opinion of the District Societies the need of each district may require, for such classes of breeding Stock of Horses, Cattle, Sheep, and Pigs as are embraced in the General Show Prize List of the Highland and Agricultural Society. The total sum to be expended by the Highland and Agricultural Society in such Grants shall not exceed the sum of £340 in any one year.

2. GRANT TO DISTRICT, £12.—The portion of the Grant to any one District Society shall not exceed the sum of £12 in any one year.

3. CONTINUANCE OF GRANT THREE YEARS—ADVERTISING.—The Grant shall continue for three alternate years, provided always that the District

Society shall, in the two intermediate years, continue the competition by offering Premiums equal in amount to not less than one-half the sum given by the Highland and Agricultural Society, and for the same class of Stock as that selected in each previous year to compete for the Highland and Agricultural Society's Prizes. The Prizes when given by the Highland and Agricultural Society must be announced as their gift. If no competition takes place for two years the Grant expires.

4. MEDALS.—In the two alternate years the Highland and Agricultural Society will place three Minor Silver Medals at the disposal of the District Societies, for the same classes of Stock as those for which the Money Premiums are offered, provided that not less than three lots are exhibited in the same class.

5. RULES OF COMPETITION.—The Rules of Competition for the Premiums, the Funds for which are derived from Grants of the Highland and Agricultural Society, shall be such as are generally enforced by the Society receiving the Grant for Premiums offered by itself.

6. AREA AND PARISHES.—FIVE PARISHES.—When making application for Grants from the Highland and Agricultural Society, the District Society must delineate the area and the number of parishes comprised in the district, and *except in special cases*, no District Society shall be entitled to a Grant whose show is not open to at least *five* Parishes.

7. NOMINATION OF MEMBERS.—At the time of making a Grant to a District Society, the Directors shall nominate one or more members of the Highland and Agricultural Society resident in the district, whose duty it shall be to see that the conditions imposed by the Board are complied with.

8. REPORTS.—Blank Reports will be furnished to the Secretaries of the different District Societies. These Reports must in all details be completed and lodged with the Secretary of the Highland and Agricultural Society on or before the 1st of November next following the competition, both in the years when the Grant is given and in the two intermediate years, for the approval of the Directors of the Highland and Agricultural Society, against whose decision there shall be no appeal. All such Reports must be signed and certified by the Members of the Highland and Agricultural Society nominated under Rule 7.

9. GRANTS—WHEN PAID.—The Grants made to District Societies will be paid in the January following the competition, by Precepts issued by the Directors of the Highland and Agricultural Society to the winners of the prizes. No payments of these Grants must be made by the Secretary or Treasurer of any District Society. Medals will be issued at the same time.

10. RENEWAL OF APPLICATION.—No application for renewal of a Grant to a District Society will be entertained until the expiration of *two years* from the termination of the last Grant.

11. DISPOSAL OF APPLICATIONS.—In disposing of applications for District Grants, the Directors of the Highland and Agricultural Society shall keep in view the length of interval that has elapsed since the expiration of the last Grant, giving priority to those District Societies which have been longest off the list.

12. DAIRY PRODUCE.—Upon application being made by District Societies, a limited number of Medals will be placed at the Disposal of District Societies for Dairy Produce.

DISTRICTS.

1. GARGUNNOCK.—*Convener*, John Murray, Munnieston, Thornhill, Stirling; *Secretary*, M. C. Stark, Westerton, Doune. Granted 1887.
2. SUTHERLAND.—*Convener*, J. B. Dudgeon, Crakaig, Golspie; *Secretary*, J. Mackintosh, Proney, Dornoch. Granted 1887.

3. STRANRAER AND RHINNS OF GALLOWAY.—*Convener*, R. Vans Agnew of Sheuchan, Park House, Stranraer ; *Secretary*, Hugh Adair, National Bank, Stranraer. Granted 1887.
4. SPEY, AVEN, AND FIDDOCHSIDE.—*Convener*, Sir George Macpherson Grant of Ballindalloch, Bart. ; *Secretary*, A. R. Stuart of Inverfiddich, Craigellachie. Granted 1891.
5. JED-FOREST.—*Convener*, Gideon Pott, Knowesouth, Jedburgh ; *Secretary*, Richard Davidson, Swinnie, Jedburgh. Granted 1891.
6. LAMMERMOOR PASTORAL.—*Convener*, Richard Stephenson, Chapel, Duns ; *Secretary*, A. M. Caverhill, Crichness, Duns. Granted 1888. (In abeyance in 1890.)
7. GARIOCH.—*Convener*, Alex. M. Gordon, of Newton, Inch ; *Secretary*, William Home, Newton of Ardoyne, Inch. Granted 1887. (In abeyance in 1888.)
8. DALBEATTIE.—*Convener*, Wellwood H. Maxwell of Munches ; *Secretary*, R. W. Macnab, Union Bank, Dalbeattie. Granted 1887. (In abeyance in 1888.)
9. DEESIDE UNION.—*Convener*, Colonel Innes of Learney, Aberdeen ; *Secretary*, James Shaw, Tillyching, Lumphanan. Granted 1888.
10. TURRIFF.—*Convener*, A. Stuart of Laithers, Turriff ; *Secretary*, R. Cruickshank, Claymires, Turriff. Granted 1888.
11. BIGGAR.—*Convener*, R. G. Murray, Spittal, Biggar ; *Secretary*, John H. Wilson, Biggar. Granted 1888.
12. BREADALBANE.—*Convener*, Archibald McDougall, Ardtalnaig ; *Secretary*, R. A. Robertson, Bank of Scotland, Killin. Granted 1888.
13. WESTER ROSS.—*Convener*, Major Randle Jackson of Swordale, Evanston ; *Secretary*, David Ross, Dingwall. Granted 1888.
14. EASTERN DISTRICT OF STIRLINGSHIRE.—*Convener*, Ralph Stark of Summerford, Falkirk ; *Secretary*, Thos. Binnie, Auctioneer, Falkirk. Granted 1888.

In 1891.

Nos. 1, 2, and 3 are in competition for the last year.

Nos. 4 and 5 are in competition for the first year.

No. 6 is in competition for the second year.

Nos. 7, 8, 9, 10, 11, 12, 13, and 14 compete for local Premiums.

SECTION 2.—GRANTS TO HORSE ASSOCIATIONS, &c., FOR STALLIONS FOR AGRICULTURAL PURPOSES.

1. HORSES—LIMIT OF GRANT, £210.—The Highland and Agricultural Society will make Grants to Horse Associations and other Societies in different districts engaging Stallions for agricultural purposes. The total sum expended by the Highland and Agricultural Society in such Grants shall not exceed the sum of £210 in any one year.

2. GRANT TO EACH, £15.—The portion of the Grant to any one Horse Association, &c., shall not exceed the sum of £15 in any one year.

3. CONTINUANCE OF GRANT THREE YEARS—INTERMEDIATE YEAR.—The Grant shall continue for three alternate years, provided always that the Horse Association or Society shall, in the two intermediate years, offer at least a sum equal in amount to that granted by the Highland and Agricultural Society for the hire of a Horse in connection with the Association or Society to whom the Grant is made.

4. NOMINATION OF MEMBERS.—At the time of making the Grant to a Horse Association or Society, the Directors of the Highland and Agricultural Society shall nominate one or more members of the Highland and Agricultural Society, resident in the Districts in which the Society bene-

fited is located, whose duty it shall be to see that the conditions imposed by the Board are complied with.

5. REPORTS—PENALTY FOR NOT ENGAGING HORSE.—No grant by the Highland and Agricultural Society to Horse Associations, &c., will be paid unless a report, signed and certified by the members appointed under Rule 4, be furnished to the Highland and Agricultural Society not later than the 1st of November in each year in which the Grant is made, and also in the alternate years, stating that a Horse has been engaged by the Horse Association or other Society to whom the Grant is made; and in the event of a Horse not being engaged in any one year while the provisions of the Grant are in force, the Grant made by the Highland and Agricultural Society will cease.

RULES 9 (Time of Payment), 10 (Renewal of Grant), and 11 (Disposal of Applications) applicable to Section 1, shall be applicable to Section 2.

DISTRICTS.

1. SELKIRK AND GALASHIELS.—*Convener*, John Scott of Gala, Galashiels; *Secretary*, Andrew T. Elliot, Newhall, Galashiels. Granted 1887.
2. NAIRNSHIRE.—*Convener*, R. Anderson of Lochdhu, Nairn; *Secretary*, John Joss, Budgate, Cawdor, Nairn. Granted 1891.
3. ELGIN AND NORTHERN DISTRICT CLYDESDALE HORSE SOCIETY.—*Convener*, William Robertson, Linkwood, Elgin; *Secretary*, James Sutor, Solicitor, Elgin. Granted 1889.
4. LANARK CLYDESDALE HORSE SOCIETY, AND UPPER WARD OF LANARKSHIRE.—*Convener*, James Renton, Cleghorn, Lanark; *Secretary*, Wm. Elliot, Markgreen, Lanark. Granted 1889.
5. LOCKERBIE.—*Convener*, Robert Smith, Dalfilble, Dumfries; *Secretary*, J. R. Byers, Victoria Square, Lockerbie. Granted 1888.
6. WESTERN DISTRICT OF MID-LOTHIAN.—*Convener*, James Paterson of Bankton, Mid-Calder; *Secretary*, John T. Mungle, West Calder. Granted 1888.
7. DALBEATTIE DISTRICT HORSE SOCIETY.—*Convener*, John Frazer, Maxwellfield, Dumfries; *Secretary*, Thomas Smith, Terrona, Langholm. Granted 1888.

In 1891.

No. 1 is in competition for the last year.

No. 2 is in competition for the first year.

Nos. 3 and 4 are in competition for the second year.

Nos. 5, 6, and 7 compete for local Premiums.

DISTRICT COMPETITIONS.

Premiums granted prior to 1887.

HORSES.

FOR AGRICULTURAL PURPOSES.

The Society's Stallion Premiums were granted to each District for two years, and were followed by Premiums for other two years for Brood

Mares, and again for a similar period by Premiums for Entire Colts and Fillies.

The Stallion and Mare Premiums have now dropped, but the Premiums for Fillies and Colts are continued till the course is finished.

1. ENTIRE COLTS AND FILLIES.

1. INVERNESS.—*Convener*, Duncan Forbes of Culloden, Inverness; *Secretary*, G. J. Campbell, 12 Lombard Street, Inverness. Granted 1890.
2. KINROSS-SHIRE.—*Convener*, Thomas Steedman, Kinross; *Secretary*, John Hay, Balleave, Kinross. Granted 1890.

PREMIUMS.

1. Best Entire Colt, foaled after 1st January 1889 . . .	£2 0 0
Second best	1 0 0
2. Best Entire Colt, foaled after 1st January 1890 . . .	2 0 0
Second best	1 0 0
3. Best Filly, foaled after 1st January 1889	2 0 0
Second best	1 0 0
Third best	0 10 0
4. Best Filly foaled after 1st January 1890	2 0 0
Second best	1 0 0
Third best	0 10 0
	£13 0 0

In 1891.

Nos. 1 and 2 are in competition for the last year.

DAIRY PRODUCE.

Upon application being made by District Societies, a limited number of Medals will be placed at the disposal of District Societies for Dairy Produce.

RULES OF COMPETITION.

Applicable to Grants prior to 1887.

1. The Members of the Highland and Agricultural Society connected with the respective districts are appointed Committees for arranging the Competitions, the Convener being appointed by the Directors; five members to be a quorum.

2. The Convener of each district shall summon a meeting of Committee for the purpose of determining the time and place of Competition, the nomination of Judges, and other preliminary arrangements. The time and place (which must be within the bounds of the District) shall be publicly intimated by Conveners.

3. The Money Premiums awarded at District Competitions will be paid in January next, by precepts issued by the Directors. No payments must therefore be paid by the Secretary or Treasurer of any local Association. Medals will be issued at same time.

4. Stock must be the property of the Exhibitor at the date of entry. *No entry shall be received later than one week previous to the Show.* Entry Money shall not exceed 2½ per cent on the amount of the Premium to be competed for.

5. Stock of an inferior description, or which does not fall within the prescribed regulations, shall not be placed for competition.

6. The Premiums shall not be divided. Five lots in each Class will warrant the award of full, and three lots of half, Premiums. A Competitor may exhibit two lots in each Class. No animal to be allowed to compete in more than one section.

7. An animal which has gained the Highland and Agricultural Society's first Money Premium at a previous District or General Show is inadmissible in the same Class; and one which has gained a second Money Premium can only thereafter compete in that Class for the first.

8. Should it be proved to the satisfaction of the Committee that an animal has been entered under a false name, pedigree, or description, for the purpose of misleading the Committee or Judges as to its qualification or properties, the case shall be reported to the Directors, and submitted by them to the first General Meeting, in order that the Exhibitor may be disqualified from again competing for the Society's Premiums, and his name, if he is a member, struck from the roll, or his case otherwise disposed of as the Directors may determine.

9. When an animal has previously been disqualified by the decision of any Agricultural Association in Great Britain or Ireland, such disqualification shall attach, if the Exhibitor, being aware of the disqualification, fail to state it and the grounds thereof in his entry, to enable the Committee to judge of its validity.

10. It is to be distinctly understood that in no instance does any claim lie against the Highland and Agricultural Society for expenses attending a show of stock beyond the amount of Premiums offered.

11. Blank reports will be furnished to the Conveners and Secretaries of the different Districts. These must, in all details, be completed, and lodged with the Secretary *on or before the 1st of November next*, for the approval of the Directors, against whose decisions there shall be no appeal.

SPECIAL GRANTS.

£20 to the Ayrshire Agricultural Association, to be competed for at the Dairy Produce Show at Kilmarnock.—*Convener*, The Hon. G. R. Vernon, M.P., Auchans House, Kilmarnock; *Secretary*, James M'Murtrie, Ayr. Granted 1872.

£3 to Orkney.—*Secretary*, James Johnston, Orphir House, Orkney. Granted 1883.

£3 to Rousay.—*Convener*, General Burroughs of Rousay, C.B.; *Secretary*, R. Mainland, Banks, Frotoft, Rousay. Granted 1883.

£3 to South Uist and Barra.—*Convener and Secretary*, Donald Paterson, Askernish, South Uist, Oban. Granted 1890.

£3 to North Uist.—*Convener*, Sir John Campbell Orde, Bart.; *Secretary*, James M. Fraser, Banker, Lochmaddy. Granted 1890.

MEDALS IN AID OF PREMIUMS GIVEN BY LOCAL SOCIETIES.

The Society, being anxious to co-operate with local Associations, will give a limited number of Minor Silver Medals annually to Societies, not on the list of Cattle, Horse, or Sheep Premiums, in addition to the Money Premiums awarded in the Districts for—

1. Best Bull, Cow, Heifer of any pure breed, or Ox.
2. Best Stallion, Mare, or Gelding.

3. Best Tup, or Pen of Ewes or Wethers.
4. Best Boar, Sow, or Pig.
5. Best Coops of Poultry.
6. Best Sample of any variety of Wool.
7. Best Sample of any variety of Seeds.
8. Best managed Farm.
9. Best managed Green Crop.
10. Best managed Hay Crop.
11. Best managed Dairy.
12. Best Sweet-Milk Cheese.
13. Best Cured Butter.
14. Best sample of Honey, not less than 5 lb., taken without destroying the bees.
15. Best collection of Roots.
16. Best kept Fences.
17. Male Farm Servant who has been longest in the same service, and who has proved himself most efficient in his duties, and to have invariably treated the animals under his charge with kindness.
18. Female Servant in charge of Dairy and Poultry who has been longest in the same service, and who has proved herself most efficient in her duties, and to have invariably treated the animals under her charge with kindness.
19. Best Sheep-Shearer.
20. Most expert Hedge-Cutter.
21. Most expert Labourer at Draining.
22. Most expert Farm Servant at trial of Reaping-Machines.
23. Best Maker of Oat-Cakes.

It is left to the local Society to choose out of the foregoing list the classes for which the Medals are to be competed.

The Medals are granted for two years.

In 1889 it was resolved that in future no Society shall receive more than two Medals for two years.

Aberdeenshire.

1. AUCHINDOIR, KILDRUMMY, AND TOWIE.—*Convener*, Carlos P. Gordon of Wardhouse, Inch; *Secretary*, James Watt, Mains of Kildrummy, Mossat. 2 Medals. 1890.
2. CLUNY, MONYMUSK, AND MIDMAR.—*Convener*, Ranald Macdonald, Cluny Castle, Aberdeen; *Secretary*, James Christie, Backhill of Castle Fraser, Kemnay. 2 Medals. 1891.
3. CROMAR, UPPER DEE, AND DONSIDER.—*Convener*, Sir John F. Clark of Tillypronie, Bart., Tarland; *Secretary*, William Thomson, Town and County Bank, Tarland. 2 Medals. 1890.
4. FYVIE.—*Convener*, James Mackie, Lewes, Fyvie; *Secretary*, James Ironside, Greenmyre, Fyvie. 2 Medals. 1890.
5. MAR.—*Convener*, George Still, Strathray, Kinaldie; *Secretary*, Silv. Campbell, jun., Tofthills, Kintore. 2 Medals. 1890.
6. NORTH-EAST ABERDEENSHIRE.—*Convener*, Alex. Lovie, Nether Boyn-die, Fraserburgh; *Secretary*, Charles Reid, Rathen. 2 Medals. 1890. (In abeyance in 1890.)
7. YTHANSIDE.—*Convener*, Robert Copland, Mill of Ardlathen, Ellon; *Secretary*, J. Johnstone, Drumwhindle Mains, Ellon. 2 Medals. 1891.

Argyllshire.

8. ISLAY, JURA, AND COLONSAY.—*Convener*, J. S. R. Ballingall, Eallabus, Islay ; *Secretary*, John Gillespie, Craigens, Islay. 2 Medals. 1890.
9. KILFERNAN.—*Convener*, George Lyon, Kildavaig, Ardlamont, Greenock ; *Secretary*, Neil Nicolson, Auchgoyle, Tigh-na-bruaich. 2 Medals. 1891.
10. KINTYRE.—*Convener*, David M'Gibbon, Ardnacraig, Campbeltown ; *Secretary*, Duncan Hamilton, Royal Bank, Campbeltown. 2 Medals. 1890.
11. LORN.—*Convener*, A. J. H. Campbell of Dunstaffnage, Oban ; *Secretary*, Donald Macgregor, Solicitor, Oban. 2 Medals. 1891.
12. MULL AND MORVERN.—*Convener and Secretary*, W. Maitland Malcolm, Auchnacraig, Mull. 2 Medals. 1890.
13. SOUTH OF MULL.—*Convener and Secretary*, W. Maitland Malcolm, Auchnacraig, Mull. 2 Medals. 1890.

Ayrshire.

14. CARRICK.—*Convener*, Alex. Cross of Knockdon, Maybole ; *Secretary*, David Brown, Royal Bank, Maybole. 2 Medals. 1890.
15. COYLTON AND STAIR.—*Convener*, Claude Hamilton, Carbieston, Ayr ; *Secretary*, Robert Caldwell, Knockshoggle, Coylton, Ayr. 2 Medals. 1890.
16. CRAIGIE.—*Convener*, James Kilpatrick, Craigie Mains, Kilmarnock ; *Secretary*, Andrew M'Farlane, Craigie, Kilmarnock. 2 Medals. 1890.
17. GALSTON, LOUDOUN, AND LANFINE.—*Convener*, J. R. Dempster, Stoneyhall, Galston ; *Secretary*, And. Cameron, Newmilns. 2 Medals. 1890.
18. IRVINE.—*Convener*, William Sloan, Brieryside, Monkton ; *Secretary*, A. C. M'Jannet, Writer, Irvine. 2 Medals. 1886. (In abeyance in 1890.)
19. KILMARNOCK.—*Convener*, J. H. Turner, Portland Estate Office, Kilmarnock ; *Secretary*, James Wilson, Kilmarnock. 2 Medals. 1890. (In abeyance in 1890.)
20. MUIRKIRK.—*Convener*, James Johnstone, Alloway Cottage, Ayr ; *Secretary*, Alex. Donald, The Schoolhouse, Muirkirk. 2 Medals. 1891.

Berwickshire.

21. LAUDERDALE.—*Convener*, Robert Shirra Gibb, Boon, Lauder ; *Secretary*, Geo. L. Broomfield, Lauder. 2 Medals. 1890.

Bute.

22. BUTE.—*Convener*, Charles Duncan, Little Kilmory, Rothesay ; *Secretary*, Thos. W. Alexander, County Buildings, Rothesay. 2 Medals. 1891.

Dumfriesshire.

23. MOFFAT AND UPPER ANNANDALE.—*Convener*, James Johnstone, Hunterheck, Moffat ; *Secretary*, John Young, Moffat. 2 Medals. 1890.

Fifeshire.

24. AUCHTERMUCHTY. — *Convener*, R. Cathcart of Pitcairlie, Auchtermuchty ; *Secretary*, Arch. Walker, Auchtermuchty. 2 Medals. 1890.
25. BALLINGRY AND AUCHTERDERRAN. — *Convener*, James Auchterlonie, Dothan, Kirkcaldy ; *Secretary*, George Constable, Glencraig, Lochgelly. 2 Medals. 1891.
26. CUPAR AND NORTH OF FIFE. — *Convener and Secretary*, George Wallace, Royal Bank Buildings, Cupar-Fife. 2 Medals. 1890.
27. WESTERN DISTRICT OF FIFE. — *Convener*, John Gilmour of Montrave, Leven ; *Secretary*, Jas. Craig, Urquhart, Dunfermline. 2 Medals. 1890.

Haddingtonshire.

28. UNITED EAST LOTHIAN. — *Convener*, ;
Secretary, Andrew Gemmell, Haddington. 2 Medals. 1891.

Inverness-shire.

29. HIGHLAND POULTRY AND PIGEON. — *Convener*, John Cran, Kirkton, Bunchrew, Inverness ; *Secretaries*, Kelly & Elliot, 4 Telford Terrace, Inverness. 2 Medals. 1889. (In abeyance in 1890.)
30. NORTHERN COUNTIES FAT SHOW. — *Convener*, Duncan Forbes of Culloiden, Inverness ; *Secretary*, F. Urquhart, 11 Union Street, Inverness. 2 Medals. 1890.

Lanarkshire.

31. ABINGTON. — *Convener*, William Hunter, Craighead, Abington ; *Secretaries*, John Morton, Nether Abington, and James Paterson, Over Abington. 2 Medals. 1890.
32. CARMUNNOCK. — *Convener and Secretary*, William Fleming, Windlaw, Carmunnock. 2 Medals. 1883. (In abeyance in 1885, 1886, 1887, 1888, and 1889.)
33. LESMAHAGOW. — *Convener*, Gavin Hamilton of Auldtown, Lesmahagow ; *Secretary*, Gavin Hamilton, jun., British Linen Co. Bank, Lesmahagow. 2 Medals. 1891.

Linlithgowshire.

34. WEST LOTHIAN. — *Convener*, George F. Melville, Lochcote, Linlithgow ; *Secretary*, Wm. Meikle, East Bonhard, Linlithgow. 2 Medals. 1891.

Perthshire.

35. STRATHEARN. — *Convener*, Colonel D. R. Williamson of Lawers, Crieff ; *Secretaries*, M'Laren & Connon, Solicitors, Crieff. 2 Medals. 1891.
36. STRATHEARN CENTRAL. — *Convener and Secretary*, Robert Gardiner, Henhill, Forteviot. 2 Medals. 1890.
37. WEEM. — *Convener*, Sir Robert Menzies of Menzies, Bart. ; *Secretary*, George J. Haynes, Camserney Cottage, Aberfeldy. 2 Medals. 1890.

Renfrewshire.

38. KILMALCOLM AND PORT-GLASGOW. — *Convener*, Alex. Love, Margaret's Mill, Kilmalcolm ; *Secretary*, John Scott, Meadowbank, Kilmalcolm. 2 Medals. 1891.

39. LOWER WARD OF RENFREWSHIRE. — *Convener*, R. Sinclair Scott, Craigievar, Skelmorlie; *Secretary*, J. W. Crawford, Greenock. 2 Medals. 1891.
40. RENFREWSHIRE. — *Convener and Secretary*, William Bartlemore, 99 High Street, Paisley. 2 Medals. 1890.
41. ROYAL WEST RENFREWSHIRE HORTICULTURAL. — *Convener*,
; *Secretary*, A. M'Naughton, 46
Brymner Street, Greenock. 1 Medal. Granted 1889. (In abeyance in 1889 and 1890.)

Stirlingshire.

42. FALKIRK HORTICULTURAL. — *Convener*, John Shields, Linlithgow; *Secretary*, James Lennox, Bellevue Cottage, Falkirk. 2 Medals. 1890.

Wigtownshire.

43. NEWTON-STEWART HORTICULTURAL. — *Convener*, A. B. Matthews, Newton-Stewart; *Secretary*, W. M. Kelly, Solicitor, Newton-Stewart. 2 Medals. 1890. (In abeyance in 1890.)

Applications from other Districts must be lodged with the Secretary of the Society by 1st November next.

RULES OF COMPETITION.

1. All Competitions must be at the instance of a local Society.
2. The classes for which Medals are granted must be in accordance with the list at pages 56 and 57. The Committee shall select the classes, and specify them in the return.
3. In each District the Convener (who must be a member of the Society appointed by the Directors) shall fix the time and place of Competition, appoint the Judges, and make all other necessary arrangements, in concurrence with the other members of the Society, and the local Association of the District.
4. The Money Premiums given in the District must be £2 for each Medal claimed.
5. The Medal for Sheep-Shearing shall not be awarded unless there are three competitors, and it shall always accompany the highest Money Premium. There must not be fewer than two competitors in all the classes.
6. Blank reports will be furnished to all the Conveners and Secretaries of the different Districts. These must, in all details, be completed and lodged with the Secretary *on or before the 1st of November next*, with the exception of green crop reports, which must be forwarded on or before the 20th of December, for the approval of the Directors, against whose decisions there shall be no appeal.
7. When a grant has expired, the District cannot apply again for aid for two years, and if no competition takes place in a District for two years the grant expires.

PLOUGHING COMPETITIONS.

The Minor Silver Medal will be given to the winner of the first or highest Premium at Ploughing Competitions, provided a Report in the following terms is made to the Secretary, within one month of the Competition, by a Member of the Society:—

FORM OF REPORT.

I, _____ of _____ Member of the Highland and Agricultural Society, hereby certify that I attended the Ploughing Match of the _____ Association at _____ in the county of _____ on the _____ when _____ ploughs competed ; _____ of land were assigned to each, and _____ hours were allowed for the execution of the work. The sum of £ _____ was awarded in the following proportions, viz. :—

[*Here enumerate the names and designations of successful Competitors.*]

RULES OF COMPETITION.

1. All Matches must be at the instance of a local Society or Ploughing Association, and no Match at the instance of an individual, or confined to the tenants of one estate, will be recognised.

2. The title of such Society or Association, together with the name and address of the Secretary, must be registered with the Secretary of the Highland and Agricultural Society, 3 George IV. Bridge, Edinburgh.

3. Not more than one Match in the same season can take place within the bounds of the same Society or Association.

4. All reports must be lodged within one month of the date of the Match, and certified by a Member of the Highland and Agricultural Society who was present at it.

5. A Member can only report one Match, and a Ploughman cannot carry more than three Medals in the same season.

6. To warrant the grant of the Medal there must have been twelve ploughs in Competition, and Three Pounds awarded in Premiums by the local Society. The Medal to be given to the winner of the first or highest prize.

7. Ploughmen shall not be allowed any assistance, and their work must not be set up nor touched by others ; on land of average tenacity the ploughing should be at the rate of an imperial acre in ten hours, and attention should be given to the firmness and sufficiency of the work below more than to its neatness above the surface.

CLASS III.

COTTAGES AND GARDENS.

The following Premiums are offered for Competition in the Parishes after mentioned.

The Premiums are granted for two years.

PREMIUMS FOR BEST KEPT COTTAGES AND GARDENS.

1. Best kept Cottage	.	.	.	.	.	£1	0	0
Second best	.	.	.	.	.	0	10	0
2. Best kept Cottage Garden	.	.	.	.	.	1	0	0
Second best	.	.	.	.	.	0	10	0

Fifeshire.

1. KINGSKETTLE.—*Convener*, William Dingwall, Ramornie, Ladybank ; *Secretary*, Thomas Blyth, Gas Manager, Kettle. Granted 1891.

RULES OF COMPETITION.

1. Competitions may take place in the different parishes for Cottages and Gardens, or for either separately.

2. The occupiers of Lodges at Gentlemen's Approach Gates and Gardeners' Houses are excluded, as well as others whom the Committee consider, from their position, not to be entitled to compete. The inspection must be completed by the 1st of October. In making the inspection, the Conveners may take the assistance of any competent judges.

3. It is left to the Committee of the District to regulate the maximum annual rent of the Cottages, which may, with the garden, be from £5 to £7.

4. To warrant the award of full Premiums, there must not be fewer than three competitors in each class. If there are less than three competitors in each class, only half Premium will be awarded.

5. A person who has gained the highest Premium cannot compete again.

6. If the Cottage is occupied by the proprietor, the roof must be in good repair; if the roof is thatch, it must be in good repair, though in the occupation of a tenant. The interior and external conveniences must be clean and orderly—the windows must be free of broken glass, clean, and affording the means of ventilation. Dunghills, and all other nuisances, must be removed from the front and gables. In awarding the Cottage Premiums, preference will be given to Competitors who, in addition to the above requisites, have displayed the greatest taste in ornamenting the exterior of their houses, and the ground in front and at the gables.

7. In estimating the claims for the Garden Premiums, the judges should have in view—The sufficiency and neatness of the fences and walks; the cleanness of the ground; the quality and choice of the crops; and the general productiveness of the garden.

8. Reports, stating the number of Competitors, the names of successful parties, and the nature of the exertions which have been made by them, must be transmitted by the Conveners to the Secretary *on or before the 1st November next*.

9. When a grant has expired, the District cannot apply again for aid for two years.

Parishes desirous of these Premiums must lodge applications with the Secretary *on or before the 1st November next*.

MEDALS FOR COTTAGES AND GARDENS OR GARDEN PRODUCE.

The Society will issue annually two Minor Silver Medals to a limited number of local Associations or individuals, who at their own expense establish Premiums for Cottages or Gardens under £15 of Rent. The Medals may be awarded for best kept Cottage, and best kept Garden or Flower Plot, or Garden Produce.

Local Associations or individuals desirous of these Medals, must lodge applications with the Secretary *on or before the 1st November next*.

The Medals are granted for two years.

Aberdeenshire.

1. KINELLAR.—*Convener*, Silvester Campbell, Kinellar, Aberdeen; *Secretary*, Neil Smith, Blackburn, Kinaldie. Granted 1891.

Dumbartonshire.

2. OLD KILPATRICK.—*Convener*, William Stewart, Milton Farm, Duntocher; *Secretary*, Donald Stewart, Parkhill, Dalmuir. Granted 1891.

Fifeshire.

3. KIRKCALDY.—*Convener*, George Prentice of Strathore, Thornton; *Secretary*, John Leslie, 293 Links Street, Kirkcaldy. Granted 1891.

4. LESLIE.—*Convener*, Hon. George Waldegrave-Leslie ; *Secretary*, John Mitchell, Prinlaws, Leslie. Granted 1890.
5. NEWBURGH.—*Convener*, Geo. Dun, Ormiston, Newburgh ; *Secretary*, Angus Cameron, Craigview, Newburgh. Granted 1890. (In abeyance in 1890.)

Inverness-shire.

6. ERCHLESS.—*Convener*, J. B. Grant, Erchless, Beauly ; *Secretary*, A. Macintosh, Erchless, Beauly. Granted 1891.
7. PETTY, ARDESIER, AND CULLODEN.—*Convener*, Duncan Forbes of Culloden, Inverness ; *Secretary*, Wm. M'Culloch, Dalziel, Fort-George Station. Granted 1890.

Kinross-shire.

8. MILNATHORT.—*Convener*, William Tod, Gospetry, Milnathort ; *Secretary*, Andrew Chalmers, Milnathort. Granted 1890.

Stewartry of Kirkcudbright.

9. KIRKPATRICK-DURHAM.—*Convener*, James M'Queen of Crofts, Dalbeattie ; *Secretary*, James G. Clingan, Kirkpatrick-Durham, Dalbeattie. Granted 1886. (In abeyance in 1890.)

Lanarkshire.

10. CAMBUSLANG.—*Convener*, John Speir, Newton Farm, Newton, Cambuslang ; *Secretary*, James M. Aitchison, Rosebank Buildings, Cambuslang. 2 Medals. 1891.
11. MIDDLE WARD OF LANARKSHIRE.—*Convener*, William Hamilton, High Motherwell, Motherwell ; *Secretary*, James A. Young, Knowetop, Motherwell. Granted 1890.

Perthshire.

12. ATHOLE.—*Convener*, Dr Irvine, Craigatin, Pitlochry ; *Secretary*, William Irvine, Delta Cottage, Pitlochry. Granted 1889. (In abeyance in 1889.)
13. BLAIRGOWRIE AND RATTRAY.—*Convener*, John Anderson, Castlehill, Rattray ; *Secretary*, Henry Dryerre, 10 High Street, Blairgowrie. Granted 1891.
14. BREADALBANE, GLENLYON, WEEM, STRATHTAY, AND GRANTULLY.—*Convener*, Alexander Galloway, Dirgarve, Aberfeldy ; *Secretary*, John Hunter, Union Bank, Aberfeldy. Granted 1890.
15. BRIDGE OF EARN.—*Convener*, Sir Robert D. Moncreiffe of Moncreiffe, Bart., Bridge of Earn ; *Secretary*, John Ellis, The Schoolhouse, Bridge of Earn. Granted 1891.
16. DUNNING.—*Convener*, J. H. J. Mackie, Invermay, Forgandenny ; *Secretary*, Johnstone Wright, Dunning. Granted 1890.

Renfrewshire.

17. HOUSTON.—*Convener*, William Fleming, Fulwood Mains, Linwood ; *Secretary*, William King, Church Road, Houston, Johnstone. Granted 1891.

Ross-shire.

18. EDDERTON.—*Convener*, W. E. Catley of Edderton ; *Secretary*, James Ross, Balblair, Edderton. Granted 1890. (In abeyance in 1890.)

Wigtownshire.

19. **INCH.**—*Convener*, The Earl of Stair, K.T., Loch Inch, Castle Kennedy ;
Secretary, Thomas C. Greig, Rephad, Stranraer. Granted 1891.

REGULATIONS.

1. Competitions may take place in the different districts for Cottages and Gardens, or for either separately.
2. The annual value of each Cottage, with the ground occupied in the parish by a Competitor, must not exceed £15.
3. If Competition takes place for Garden Produce in place of the best kept Garden, such produce must be *bona fide* grown in the Exhibitor's Garden, and he will not be allowed to make up a collection from any other Garden.
4. To warrant the award of the Medals, there must not be fewer than three Competitors.
5. Blank reports will be furnished to the Conveners and Secretaries of the different Districts. These must, in all details, be completed and lodged with the Secretary *on or before the 1st November next*, for the approval of the Directors, against whose decisions there shall be no appeal.
6. When a grant has expired, the District cannot apply again for aid for two years.

IMPROVING EXISTING COTTAGES.

To the Proprietor in Scotland who shall report the Improvement of the greatest number of Cottages during the years 1888, 1889, and 1890—The Gold Medal.

BUILDING NEW COTTAGES.

To the Proprietor in Scotland who shall report the Erection of the greatest number of approved Cottages during the years 1887, 1888, 1889, and 1890—The Gold Medal.

RULES OF COMPETITION.

1. Claims for the Premiums must be lodged with the Secretary on or before the 1st of October next, to allow an inspection to be made of the different Cottages. The inspection will be conducted by a Committee of the Society's Members, and Reports must be transmitted to the Secretary *on or before the 1st November next*.
2. The annual value of the Cottage or Cottages separately, with the garden ground, must not exceed £5.
3. In estimating the claims of the Competitors, the following points will be kept in view: The external appearance of the Cottages ; their internal accommodation ; the arrangements of the out-houses ; the means of drainage and ventilation ; and the expense of the building or of the alteration, compared with its durability and accommodation. When the Cottages of one Competitor are superior in style and comfort to those of another, though not so numerous, the Inspectors will give them preference, provided they amount at least to three, and have been erected at a moderate expense.
4. Parties competing will forward to the Society Plans, Specifications, and Estimates, of which, and of all information sent therewith, copies may be taken for publication, if the Society shall see fit, and the originals returned to the parties within six months, if desired.

HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

GENERAL SHOW OF STOCK AND IMPLEMENTS

AT

STIRLING,

ON 28TH, 29TH, 30TH, AND 31ST JULY 1891.

LAST DAYS OF ENTRY.

IMPLEMENTS AND OTHER ARTICLES—Monday, 25th May.

STOCK, POULTRY, AND DAIRY PRODUCE—Monday, 22d June.

No Entry taken later than by first post on Monday morning (22d June).

Post Entries for Stock only taken at double fees till Wednesday morning (24th June) at 10 o'clock.

COVERED BOOTHS FOR OFFICES—Monday, 22d June.

President of the Society.

HIS GRACE THE DUKE OF MONTROSE, Buchanan Castle, Drymen.

Condener of the Local Committee.

SIR JAMES R. G. MAITLAND of Barnton, Bart., Craigend, Stirling.

The District connected with the Show comprises the Counties of Stirling, Dumbarton, and Clackmannan, and the Western Division of Perthshire.

REGULATIONS.

GENERAL CONDITIONS.

1. The Competition is open to Exhibitors from all parts of the United Kingdom.

2. Every Lot must be intimated by a Certificate of Entry, lodged with the Secretary *not later than Monday, 25th May, for Implements and other Articles, and Monday, 22d June, for Stock, Poultry, and Dairy Produce.* No Entry taken later than by first post on Monday morning, 22d June. Post Entries for Stock only taken at double fees till Wednesday morning (24th June) at 10 o'clock. Printed forms of Entry will be issued on application to the Secretary, No. 3 George IV. Bridge, Edinburgh. Admission Orders will be forwarded to Exhibitors, by Post, previous to the Show.

3. Protests against the awards of the Judges, or against a violation of

the judging regulations, must be lodged with the Secretary not later than 9 A.M. on Wednesday, 29th July, and parties must be in attendance at the Committee Room, in the Showyard, at 9.30 A.M. that day, when protests will be disposed of. All protests must be accompanied by the deposit of £2, 2s., and if not sustained the sum will be forfeited at the discretion of the Directors.

4. Protests lodged for causes which the protestor produces no good evidence to substantiate, will render him liable to be reported to the Board of Directors, with the view, if they see reason, of his being prohibited from again entering Stock for a General Show.

5. The Society shall not be liable for any loss or damage which Stock, Poultry, Dairy Produce, Implements, or other articles may sustain at the Show, or in transit.

6. The decisions of the Board of Directors are final in all questions respecting Premiums and all other matters connected with the Show, and it shall not be competent for any Exhibitor to appeal against such decisions to, nor seek redress in respect of them from, any other tribunal.

7. Covered Booths for Offices (9 feet by 9 feet), purely for business, not for exhibition of goods, can be had for £3, 10s. to Members and £5 to Non-Members. Intimation to be made to the Secretary on or before the 22d of June. Those applying after that date to pay double Entry Money, but no application can be received later than 10th July.

8. No lights allowed in the Yard at night, and Smoking is strictly prohibited within the Sheds. Those infringing this Rule will be fined 10s.

9. As the command of water in the Yard is limited, it is particularly requested that waste be avoided.

10. When the ground requires to be broken, the turf must be carefully lifted and laid aside, and the surface must be restored to the satisfaction of the Society, and at the expense of the Exhibitor.

11. All persons admitted into the Showyard shall be subject to the Rules and Orders of the Directors.

12. The Stewards have power to enforce the Regulations of the Society in their different departments, and to bring to the notice of the Directors any infringement thereof.

13. All persons in charge of Stock or other Exhibits shall be subject to the orders of the Stewards.

14. The violation by an Exhibitor of any one of the Regulations will involve the forfeiture of all Premiums awarded to him, or of such a portion as the Directors may ordain.

15. Railway Passes for unsold Stock and Implements must be applied for at the Committee Room in the Yard between 9 and 11 o'clock on the forenoon of Thursday and Friday.

16. The Show terminates at 5 P.M. on Friday, 31st July, and no animal or article can be withdrawn before that hour. Steam Engines not till 6 o'clock. Stock and Implements may remain in the Yard till Saturday afternoon.

17. The Premiums awarded will be paid in November 1891, and, with the exception of the Tweeddale Gold Medal and the Silver Medals, may be taken either in money or in plate.

STOCK AND POULTRY.

18. Poultry and Stock will be admitted on Monday, 27th July, and, with the exception of Horses, must be in the Yard before 12 o'clock that night. Horses must be in before 8 o'clock on the morning of Tuesday, except those entered for Jumping only, which do not require to be in till Wednesday morning before 8 o'clock. Judging to commence at 10 A.M. on Tuesday, 28th July. Exhibited on Tuesday, Wednesday, Thursday,

and Friday, 28th, 29th, 30th, and 31st July. Stock may be admitted on Saturday the 25th July, but only by sending information to the Secretary before the 23d July.

19. An animal which has gained a first Premium at a General Show of the Society cannot again compete in the same section, but may be exhibited as Extra Stock.

20. All animals, except calves, foals, and lambs shown with their dams, must be entered in the sections applicable to their ages, and cannot be withdrawn after entry.

21. No animal to be allowed to compete in more than one section, except for Jumping.

22. Shorthorn, Aberdeen-Angus, and Galloway animals must be entered in the herd books, or the Exhibitor must produce evidence that his animal is eligible to be entered therein.

23. Stock must be *bona fide the property and in the possession of* the Exhibitor on the last day of Entry.

24. The Schedule of Entry must be filled up so far as within the knowledge of the Exhibitor.

25. The name of the Breeder, if known, must be given, and if the Breeder is not known, a declaration to that effect, signed by the Exhibitor, must be sent along with the Schedule, and no pedigree will be entered in the Catalogue when the Breeder is unknown.

26. Should it be proved to the satisfaction of the Directors that an animal has been entered under a false name, pedigree, or description, for the purpose of misleading the Directors or Judges as to its qualification or properties, or that information required in the Schedule and known or easily ascertained by the Exhibitor has been withheld, such animal may be disqualified either before or after a prize has been awarded to it, and the case may be reported to the first Meeting of Directors, in order that the Exhibitor may be disqualified from again competing at the Society's Shows, or his case otherwise disposed of as the Directors may determine.

27. When an animal has previously been disqualified by the decision of any Agricultural Association in the United Kingdom, such disqualification shall attach, if the Exhibitor, being aware of the disqualification, fail to state it, and the grounds thereof, in his entry, to enable the Directors to judge of its validity. Any person who is disqualified from exhibiting at any Show in the United Kingdom, shall be prohibited from exhibiting at any General Show of the Society unless with the special consent of the Board.

28. Breeding Stock must not be shown in an improper state of fatness, and the Judges are requested not to award Premiums to overfed animals; and no Cattle or Sheep which have been exhibited as Fat Stock at any Show are eligible to compete in the Breeding Sections for the Society's Prizes.

29. Horses and Cattle must be paraded when required by the Stewards, and under their direction; and the prize and commended animals will receive two Rosettes, which must be attached to the head of the animal, one on each side.

30. Exhibitors shall be answerable for all acts, whether committed by themselves, their servants, or others in charge of their Stock, and shall be responsible for the condition of their animals during the whole time they remain in the Showyard.

31. No animal to be taken out of its stall after 10 A.M. during the Show except by order of the Stewards, or with permission of the Secretary. Those infringing this Rule will be fined 10s.

32. Aged Bulls and Stallions must have had produce, and, along with Two-year-old Bulls, Three-year-old Colts, and aged Tups, have served within the year of the Show.

33. All Cows must have had calves previous to the Show, and when ex-

hibited they must either be in milk or in calf ; if in milk, birth must have been within 9 months of the Show ; if in calf, birth must be certified within 9 months after the Show. This Rule does not apply to animals in Family Groups.

34. Cows in the Family Groups must have had calves previous to the Show, and when exhibited they must be either in milk or in calf. Two-year-old Heifers in the Family Group Prizes to be certified to have been served before the Show, except Highland Heifers, which need not be served till 3 years old.

35. All Milk Cows of the Ayrshire breed must be in the Yard on the evening of Monday, 27th July, before 8 o'clock, after which they will be inspected by the Veterinary Surgeon, or other official of the Society, between 8 and 9 o'clock, to see if they have been milked dry ; and if not, they must be milked under his direction, and, after the judging, all Milk Cows must be milked morning and evening.

36. Any artificial contrivance or device of any description found on or proved to have been used on an animal, either for preventing the flow of milk or for any other improper purpose, will disqualify that animal from being awarded a Premium, and the Owner of said animal will be prohibited from again entering Stock for any of the Society's General Shows, or for such a period as the Directors may see fit.

37. Two-year-old Heifers—of the Shorthorn, Aberdeen-Angus, and Galloway breeds—must be in calf when exhibited, and the Premiums will be withheld till birth be certified, which must be within 9 months after the Show. This Rule does not apply to animals in the Family Groups.

38. Animals of any age that have had a calf must be shown as Cows.

39. Mares in Section 5 must have produced foals after 1st January 1891, and foals must be at foot. In the case of a Mare whose foal has died, she shall without further entry be eligible to compete among the Yeld Mares. Mares in Section 6 must be in foal, and awards will be suspended till birth is certified, which must be within 11 months from the date of the Show.

40. With reference to Regulations 33 and 37, birth of at least a seven months' calf must be certified ; and in regard to Regulation 39, birth of at least a nine months' foal.

41. No rug shall be hung up so as to conceal any animal in a horse-box or stall, except with special permission of the Steward of that department.

42. Horses entered as Hunters must be tried over the leaping-bar if required by the Judges.

43. Judges are particularly requested to satisfy themselves, as far as possible, regarding the soundness of all Horses before awarding the Prizes, and to avoid giving a preference to animals showing symptoms of hereditary diseases. The Judges may consult the Society's Veterinary Surgeon if they deem it expedient. No protests on veterinary grounds will be received.

44. All Ewes must have reared lambs in 1891 ; and Ewes of the Black-faced and Cheviot breeds must be in milk, and have their lambs at foot.

45. Sheep must have been clipped bare after 1st January 1891, and the Judges are instructed to examine the fleeces of the Sheep selected for Prizes, and to cast those on which they find any of the former fleece.

46. Sows must have reared pigs in 1891 or be in pig ; and Pigs must belong to the same litter, and be uncut.

47. In Poultry the Aged Birds must have been hatched previous to, and Cockerels and Pullets in, 1891.

48. Bulls must be secured by nose-rings, with chains or ropes attached, or with strong halters and double ropes. All Cattle must be tied in their stalls.

49. Servants in charge of Stock must bring their own buckets or pails, and a piece of rope or sheep-net to carry their forage. Mangers, sheep and pig troughs will be provided.

50. Loose-boxes will be provided for Stallions, Three, Two, and One

year-old entire Colts, and for Mares with foals at foot ; closed-in stables for all the other Horses, and covered accommodation for the whole of the other Stock.

51. Straw, hay, grass, and tares will be provided free by the Society during the four days of the Show. Animals in the Yard all Monday to get full rations ; those arriving after 12 o'clock noon half rations ; other kinds of food will be supplied at fixed prices in the Forage-yard. Any servant removing bedding from an adjoining stall will be fined in double the amount taken. Exhibitors may fetch their own cake or corn to the Yard, but not grass, tares, hay, nor straw. Coops, food, and attendance for Poultry will be found by the Society.

52. Cattle, Sheep, Swine, or Poultry cannot be removed from the Yard till 5 p.m. on Friday, 31st July, except on certificate by the Veterinary Surgeon employed by the Directors, countersigned by the Steward of the department and the Secretary.

53. Horses may be withdrawn at 6 o'clock each evening on a deposit of £5 for each animal, which shall be forfeited, along with any prize money it may have gained, if the animal is not brought back. They must return between 7 and 7.30 the following morning, and those not in before 8 will forfeit 10s. Horse passes to be applied for at the Committee Room between 5 and 6 p.m. on Tuesday, and the deposit will be returned between 12.30 and 2.30 on Friday.

54. When the Stock is leaving the Yard, no animal is to be moved till ordered by those in charge of clearing the Yard. Those transgressing this Rule will be fined 10s., and detained till all the other Stock is removed.

JUDGING STOCK AND POULTRY.

55. On Tuesday, 28th July, no person will be admitted, except Servants in charge of Stock, till 8 a.m., when the Gates are opened to the public.

56. The Judges will commence their inspection at 10 a.m. The space reserved for the Judges will be enclosed by ropes, and no encroachment will be permitted. In no case shall a Premium be awarded unless the Judges deem the animals to have sufficient merit ; and where only one or two lots are presented in a section, and the Judges consider them unworthy of the Premiums offered, it shall be in their power to award a lower prize, or to suggest the removal of any lot which appears to them unworthy of being placed in the Yard.

57. In addition to the Premiums, the Judges are authorised to award three Commendations in each section (except Poultry, where only two Prizes and one Commendation are to be awarded), if the entries are numerous and the animals of sufficient merit. These Commendations to consist of—Very Highly Commended, Highly Commended, and Commended.

58. The animals in Section 10 (Ayrshire breed) which have not calved before the Show, will be judged along with the Cows in Calf, and those in Section 11 which have calved before the Show will be judged along with Cows in Milk.

59. Two Members of Committee and a Director will attend each section of the Judges. It will be their duty to bring the animals out to the Judges and to see that no obstruction is offered to them, and that the space reserved for them is not encroached on ; to ticket the prize animals ; to send the Nos. of prize animals to the Award Lectern ; to assist the Judges in completing their reports ; and should any difficulty arise, to communicate with the Stewards.

60. It shall not be competent for any Exhibitor, nor for his Factor or Land-Steward, to act as a Judge or attending Member in any class in which he is competing.

DAIRY PRODUCE.

61. Dairy Produce will be received in the Showyard on Monday, 27th July, and till 8 A.M. on Tuesday, 28th July. Judged at 10 A.M. on Tuesday. Exhibited Tuesday, Wednesday, Thursday, and Friday.

62. Dairy Produce must have been made on the Exhibitor's farm in 1891. No Exhibitor to show more than one lot in each section. At least 1 cwt. of the variety of Butter and 2 cwt. of that of the Cheese exhibited must have been made during the Season. The lots must be fair samples, and untasted. No lot can be removed from the Yard till 5 P.M. on Friday, 31st July.

STALL RENT.

63. The following rates shall be paid by Exhibitors when making their Entries :—

	Members.		Non-Members.	
	s.	d.	s.	d.
Cattle, each	15	0	25	0
Boxes for Stallions—3 and 2 year-old entire Colts, and Mares with Foals at foot	30	0	40	0
Boxes for one-year-old entire Colts	20	0	30	0
Stallions, 12 hands and under	15	0	20	0
Mares or Geldings, 12 hands and under	10	0	15	0
All other Horses, each	20	0	30	0
Sheep, per pen	10	0	15	0
Swine, per pen	15	0	20	0
Poultry, each entry	3	0	5	0
Dairy Produce, each entry	4	0	6	0
Stalls for Attendants, same rates as above.				
Covered Booths for offices, 9 feet by 9 feet	70	0	100	0
Newspaper offices £2, 10s.				

FINE FOR STOCK NOT FORWARD.

64. In order to lessen the number of vacant Stalls, the following fines will be imposed on all Exhibitors whose animals are not forward : For Horses, 40s. ; Cattle, 20s. ; Sheep and Swine, 10s. ; Poultry, 5s. ;—this fine to be in addition to Entry Money. In the case of death or illness of an animal, a Veterinary Surgeon's Certificate is necessary for a remit of the fine.

EXTRA STALL FOR ATTENDANTS.

65. Exhibitors of Stock shall be entitled to take an extra Stall for the accommodation of their attendants without being liable to a fine, but they must state when making their Entry that the Stall is to be used for that purpose, and remit rent.

IMPLEMENTS AND OTHER ARTICLES.

66. Implements will be received in the Yard on Tuesday, 21st July, and till 5 o'clock on the afternoon of Monday, 27th July. Exhibited Tuesday, Wednesday, Thursday, and Friday, 28th, 29th, 30th, and 31st July. The Schedule of Entry must be filled up so far as within the knowledge of the Exhibitor, and prices must be stated.

67. No Money Prizes or Medals will be given for Implements of any kind, and no inspection of them by Judges will take place.

68. Agricultural Implements, and Implements and collections of articles not Agricultural, will be received for Exhibition, but the Secretary is entitled to refuse Entries from dealers in articles not deemed worthy of Exhibition.

69. Implements will be placed in the following sections—viz., 1st, Under Cover, for Agricultural Implements; 2d, Open, for Agricultural Implements; 3d, Exhibits not Implements of Husbandry, which will be placed apart from the Agricultural Implements, either under cover or open, as may be deemed necessary by the Secretary; 4th, Motion Yard; 5th, Open space for Agricultural Implements from local country operative Blacksmiths and Carpenters. See below.¹ Exhibitors must specify the space they require.

70. The articles of each Exhibitor must be all placed in one stand, except Implements in motion, and must not on any account extend beyond the width allowed. No article to be moved out of its stand, or the stand dismantled, till the termination of the Show, at 5 P.M. on Friday, 31st July. Those infringing this Rule will be fined 10s.

71. Exhibitors must arrange their own articles *within* the space allotted to them before 9 o'clock on Tuesday the 28th July, and to the satisfaction of the Stewards in charge of the Implement Yard.

72. All Machines requiring steam or fire must be entered as such in the Certificate; and will be placed in the Motion Yard. *Coke only to be used in all cases where fire is required after 10 o'clock A.M.* Those infringing this Rule will incur a penalty of £5.

73. No Steam Engine shall be driven in the Yard at a greater speed than 4 miles an hour.

74. Locomotive and Traction Engines and other Machines must not be moved from their places without permission of the Stewards, and must not leave their stands till 6 P.M. on Friday.

75. There must be attached to each Implement, when forwarded to the Show, a label bearing the Exhibitor's name, and that of the Implement.

76. The carriage of all Implements must be prepaid.

STALL RENT.

77. Ground to be taken in spaces of 10 feet frontage by 20 feet deep, except in Motion Yard, which is to be 10 feet or any larger amount of frontage by 50 feet deep. Except for exhibits not agricultural, no boarding shall exceed 4 feet in height.

78. The following rates shall be paid by Exhibitors when making their Entries:—

	Members.	Non-Members.
Implement Shedding, 20 feet deep, 7 feet high, per 10 feet	£1 5 0	£1 15 0
Implements without Shedding, 20 feet deep, per 10 feet	1 5 0	1 15 0
Implement space in Motion Yard, without Shedding, 50 feet deep, per foot	0 2 6	0 3 6
And with Shedding, 20 feet deep, 10 feet high, per foot	0 6 0	0 8 0
Covered Booths for offices, 9 feet by 9 feet each	3 10 0	5 0 0
Newspaper offices, each	£2, 10s.	

¹ In order to encourage exhibits of Agricultural Implements from local country operative Blacksmiths and Carpenters, open space will be provided for these in some less prominent part of the Yard at a charge of Entry Money of 1s. per running foot of frontage, 20 feet deep.

ADMISSION TO YARD.

The Public will be admitted on Tuesday, 28th July, at 8 A.M. The inspection by the Judges commences at 10 A.M. The charges will be—Tuesday, from 8 A.M. till 5 P.M., 5s.; Wednesday, from 8 A.M. till 5 P.M., 3s.; Thursday, from 8 A.M. till 5 P.M. 1s.; Friday, from 8 A.M. till 5 P.M., 1s.

Members of the Society are admitted to the Showyard without payment, on exhibiting a "*Member's Ticket*," which is strictly not transferable. Tickets will be sent to all members residing in the United Kingdom whose addresses are known, and on no account will duplicates be issued. All Members not producing their tickets must pay at the gate, and the admission money will not be returned.

Exhibitors of Stock (not Members) are admitted free on producing their tickets.

Exhibitors of Implements (not Members) and their attendants will be entitled to free entry during the Show, but must remain at their stalls during the judging of the Stock on Tuesday.

Tickets for attendants on Stock and Implements are not available to admit to the Yard between 11 A.M. and 5 P.M.; and any attendant requiring to leave the Yard during the day cannot be again admitted except by a special pass (to be applied for at the Ticket Gate), which must be given up on his return.

Placards, except those of the Society, are prohibited both inside the Showyard and on the outside of the Boundary Fence, with the exception of those belonging to Exhibitors, whose right is confined to their own stalls. No newspapers or any other article allowed to be carried about the Yard for sale or display. No strolling bands or musicians admitted.

No Carriages or Equestrians admitted without special leave from the Directors, and then only for Invalids. Bath-chairs may be brought in.

Premium Lists, Regulations, and Certificates of Entry may be obtained by applying at the Secretary's Office, No. 3 George IV. Bridge, Edinburgh.

All Communications should be addressed to FLETCHER NORTON MENZIES, Esq., Secretary of the Highland and Agricultural Society of Scotland, No. 3 George IV. Bridge, Edinburgh.

LAST DAYS OF ENTRY.

IMPLEMENTS AND OTHER ARTICLES—Monday, 25th May.

STOCK, POULTRY, AND DAIRY PRODUCE—Monday, 22d June.

No Entry taken later than by first post on Monday morning (22d June). Post Entries for Stock only taken at double fees till Wednesday morning (24th June) at 10 o'clock.

COVERED BOOTHS FOR OFFICES—Monday, 22d June.

RAILWAY ARRANGEMENTS.

The Railway Companies will be furnished with a list of the Exhibitors of Stock and Implements, after the 8th of July, and all applications for horse-boxes and trucks, and for information as to arrangements of Special Trains, must be made by the Exhibitors themselves with the Station-master where their stock is to be trucked.

The Railway Companies have adopted the following Regulations :—

STOCK AND EXHIBITS TO AND FROM AGRICULTURAL SOCIETIES' ANNUAL SHOWS, THE SMITHFIELD CLUB CATTLE SHOW, AND THE BRITISH FARMERS' DAIRY SHOW.

Live Stock.

1. Live Stock *to* the Show to be charged ordinary rates.
2. Live Stock *from* the Show, *if sold*, to be charged ordinary rates.
3. Live Stock *from* the Show, *if unsold*, to be conveyed at half rates back to the station whence they were sent, at owners' risk, on production of a certificate from the Secretary of the Agricultural Show to the effect that they are really unsold ; failing production of such certificate, ordinary rates must be charged. The reduction to half rate is to be allowed only when the animals are returned by the same route as that by which they were conveyed to the Show. Minimum charge for Stock returned at half rates to be one-half the ordinary minimum.
- If the unsold Live Stock which was conveyed on the outward journey by Passenger Train in horse-boxes be required to be returned by Goods Train in cattle trucks, half the Goods Train rates must be charged.*
4. Live Stock rates are "station to station" only.
5. Unsold Live Stock transferred from one Agricultural Show to another, in another part of the country, must be charged ordinary rates.
6. Poultry to be charged ordinary rates both ways.
7. Horse-boxes must not be provided for the carriage of Live Stock sent by Goods Train and invoiced at Goods Train rates.
8. Provender conveyed to Agricultural Shows with Live Stock is to be charged ordinary rates, except so much of the same as may be required on the journey.
9. Men, certified by the owners to be *bona fide* in charge of Live Stock, to be conveyed free in the same train as the animals ; the number not to exceed one man to each vehicle.

NOTE.—*Upon both the outward and homeward journey a separate certificate must be given (upon the proper Form), which must be retained by the station-master at the outward or homeward starting-point, as the case may be.*

10. For men in charge of Live Stock forwarded by Goods Train, no separate pass must be issued, but the form of pass must be printed upon the Live Stock Ticket, which must be delivered up on the arrival of the Live Stock at their destination.

NOTE.—*Regulations Nos. 1-10 as above apply also to Live Stock to and from all fixed periodical Horse and Cattle Shows where the animals are sent to compete for prizes.*

Agricultural Machines, Implements, and other Exhibits.

11. Agricultural Machines, Implements, and other Exhibits to the Show to be charged ordinary rates.

12. Agricultural Machines, Implements, and other Exhibits *from* the Show, *if sold*, to be charged ordinary rates.

13. Agricultural Machines, Implements, and other Exhibits *from* the Show, *if unsold*, to be conveyed at half rates back to the station whence they were sent, at owners' risk, on production of a certificate from the Secretary of the Agricultural Show to the effect that they are really unsold; failing production of such certificate, ordinary rates must be charged. The reduction to half rate is to be allowed only when the articles are returned by the same route as that by which they were conveyed *to* the Show.

14. The ordinary rates do not include delivery *to*, or collection *from*, the Show Ground.

15. Unsold goods transferred from one Agricultural Show to another, in another part of the country, must be charged ordinary rates.

16. Agricultural Societies' Show Plant must be charged at Special Class rates, station to station.

Tents, Canvas, &c.

17. Tents, Canvas, and other articles carried to Agricultural Shows, not for exhibition or sale, to be charged the usual rates both going and returning.

PREMIUMS.

In addition to the Premiums, the Judges are authorised to award three Commendations in each Section (except Poultry, where only two Prizes and one Commendation are to be awarded), if the Entries are numerous and the animals of sufficient merit. These Commendations to consist of—Very Highly Commended, Highly Commended, and Commended.

The Directors are willing to accept suitable Champion Cups or Prizes, of not less than £10 in value, for the recognised Breeds of Cattle, Horses, and Sheep, &c. Intimation to be made to the Secretary on or before 1st April.

CLASS I.—CATTLE.

Section	SHORTHORN.	Premiums.		
		1st. £	2d. £	3d. £
	Tweeddale Gold Medal for best Bull, £20.			
1.	Bull calved before 1st Jan. 1889 . . .	20	10	5
2.	Bull calved on or after 1st Jan. 1889 . . .	15	10	5
3.	Bull calved on or after 1st Jan. 1890 . . .	12	8	4
	Breeder of Best Bull of any age in the three Sections,—The Silver Medal.			
4.	Cow of any age	12	8	4
5.	Heifer calved on or after 1st Jan. 1889 . . .	10	5	3
6.	Heifer calved on or after 1st Jan. 1890 . . .	10	5	3
				£149

AYRSHIRE.

7.	Bull calved before 1st Jan. 1889 . . .	15	10	5
8.	Bull calved on or after 1st Jan. 1889 . . .	12	8	5
9.	Bull calved on or after 1st Jan. 1890 . . .	8	5	3
	Breeder of best Bull of any age in the three Sections,—The Silver Medal.			
10.	Cow in Milk, of any age	12	8	4
11.	Cow in Calf, of any age	10	7	3
12.	Heifer calved on or after 1st Jan. 1889 . . .	10	5	3
13.	Heifer calved on or after 1st Jan. 1890 . . .	8	5	3
				149
Carry forward		...	...	£298

Brought forward		...	...	£298
		Premiums.		
ABERDEEN-ANGUS.		1st.	2d.	3d.
Section		£	£	£
14. Bull calved before 1st Dec. 1888	.	20	10	5
15. Bull calved on or after 1st Dec. 1888	.	15	10	5
16. Bull calved on or after 1st Dec. 1889	.	12	8	4
Breeder of best Bull of any age in the three Sections,—The Silver Medal.				
17. Cow calved before 1st Dec. 1887	.	12	8	4
18. ¹ Cow three years old, £12, £8, £4.	.			
19. Heifer calved on or after 1st Dec. 1888	.	10	5	3
20. Heifer calved on or after 1st Dec. 1889	.	10	5	3
				149
GALLOWAY.				
21. Bull calved before 1st Jan. 1889	.	20	10	5
22. Bull calved on or after 1st Jan. 1889	.	15	10	5
23. Bull calved on or after 1st Jan. 1890	.	12	8	4
Breeder of best Bull of any age in the three Sections,—The Silver Medal.				
24. Cow of any age	.	12	8	4
25. Heifer calved on or after 1st Jan. 1889	.	10	5	3
26. Heifer calved on or after 1st Jan. 1890	.	10	5	3
				149
HIGHLAND.				
27. Bull calved before 1st Jan. 1889	.	20	10	5
28. Bull calved on or after 1st Jan. 1889	.	15	10	5
29. Bull calved on or after 1st Jan. 1890	.	12	8	4
Breeder of best Bull of any age in the three Sections,—The Silver Medal.				
² Best Bull in the three Sections, £10.				
30. Cow of any age	.	12	8	4
31. Heifer calved on or after 1st Jan. 1888	.	10	5	3
32. Heifer calved on or after 1st Jan. 1889	.	10	5	3
² Best Female Animal in the three Sections, £10.				
				149
				<u>£745</u>

¹ Given by Mr Macpherson Grant of Drumduan.² Given by Mr Smith of Ardtornish.

CLASS II.—HORSES.

Section	FOR AGRICULTURAL PURPOSES.				Premiums.			
	1st.	2d.	3d.	4th.	£	£	£	£
1. Stallion foaled before 1st Jan. 1888	20	15	10	5				
2. Entire Colt foaled on or after 1st Jan. 1888	15	12	8	4				
3. Entire Colt foaled on or after 1st Jan. 1889	15	10	6	3				
4. Entire Colt foaled on or after 1st Jan. 1890	12	7	4	2				
Breeder of Best Male Animal of any age in the four Sections,—The Silver Medal.								
Best Stallion in the four Sections registered in the Clydesdale Stud-Book,—Silver Medal value £2, 10s., ¹ also Prize of £10, 10s. ² for do.—£13.								
5. Mare of any age, with Foal at foot.	20	10	5	3				
6. Mare (in Foal) foaled before 1st Jan. 1888	15	10	5	3				
7. Filly foaled on or after 1st Jan. 1888	10	6	3	2				
8. Filly foaled on or after 1st Jan. 1889	10	6	3	2				
9. Filly foaled on or after 1st Jan. 1890	10	6	3	2				
Best Female Animal in the five Sections registered in the Clydesdale Stud-Book,—Silver Medal value £2, 10s., ³ also Prize of £10, 10s. ⁴ for do.—£13.								
								£282

SPECIAL PRIZES.

- 10.⁵ Yearlings the produce of the Queen's Premium Stallions that have served in Scotland, out of Mares of any breed,—Five Prizes, £10, £7, £5, £2, £1.

HUNTERS AND ROADSTERS.

11. Mare or Gelding, suitable for field, foaled before 1st Jan. 1888	12	8	4	
Carry forward	12	8	4	£282

No animal is allowed to compete in more than one Section, except for Jumping.

¹ ² Given by the Clydesdale Horse Society.

² ⁴ Given by Lord Polwarth, ex-President of the Clydesdale Horse Society.

³ Given by Captain Clayhills Henderson of Invergowrie.

		Brought forward £282		
		Premiums.		
HUNTERS AND ROADSTERS— <i>contd.</i>		1st.	2d.	3d.
Section		£	£	£
	Brought forward .	12	8	4
12.	Mare or Gelding, suitable for field, foaled on or after 1st Jan. 1888 .	12	8	4
13.	Mare or Gelding, suitable for field, foaled on or after 1st Jan. 1889 .	10	5	3
14.	Mare or Gelding, suitable as Hack- ney or Roadster, to be exhibited in saddle only	8	4	2
15.	Mare or Gelding, suitable for driving, 3 years old and upwards, to be shown in harness and driven .	8	4	2
16. ¹	Horse or Mare, for jumping .	20	10	5
		129		
PONIES.				
17.	Stallion, 15 hands and under .	6	3	1
18.	Mare or Gelding, between 13 and 14½ hands	6	3	1
19.	Mare or Gelding, between 12 and 13 hands	6	3	1
20.	Mare or Gelding, under 12 hands .	6	3	1
21.	Shetland Stallion, not exceeding 10½ hands	4	2	1
22.	Shetland Mare or Gelding, not ex- ceeding 10½ hands	4	2	1
23. ¹	Ponies, 14 hands and under, for jumping	5	3	1
		63		
		£474		

No animal is allowed to compete in more than one Section, except for Jumping.

CLASS III.—SHEEP.

		Premiums.		
BLACKFACED.		1st.	2d.	3d.
Section		£	£	£
1.	Tup above one shear	12	8	4
2.	Shearling Tup	12	8	4
Carry forward		24	16	8

¹ Animals entered in the other Sections may compete for Jumping. Animals entered for Jumping only do not require to come to the Showyard till Wednesday morning before 8 o'clock.

Section		Premiums.		
		1st.	2d.	3d.
	Brought forward .	£ 24	£ 16	£ 8
3.	Three Ewes above one shear, with their Lambs at foot .	10	5	2
4.	Three Shearling Ewes or Gimmers .	10	5	2
				£82

CHEVIOT.

5.	Tup above one shear .	12	8	4
6.	Shearling Tup .	12	8	4
7.	Three Ewes above one shear, with their Lambs at foot .	10	5	2
8.	Three Shearling Ewes or Gimmers .	10	5	2
				82

BORDER LEICESTER.

9.	Tup above one shear .	12	8	4
10.	Shearling Tup .	12	8	4
11.	Three Ewes above one shear .	10	5	2
12.	Three Shearling Ewes or Gimmers .	10	5	2
				82

SHROPSHIRE.

13.	Tup above one shear .	10	5	3
14.	Shearling Tup .	10	5	3
15.	Three Ewes above one shear .	8	4	2
16.	Three Shearling Ewes or Gimmers .	8	4	2
				64

OXFORD DOWN.

17.	Tup above one shear .	5	3	—
18.	Shearling Tup .	5	3	—
19.	Three Ewes above one shear .	5	3	—
20.	Three Shearling Ewes or Gimmers .	5	3	—
				32

EXTRA SECTIONS.

21.	Three Blackfaced Wethers, one shear	5	3	2
22.	Three Cheviot Wethers, one shear .	5	3	2
23. ¹	Three Cross-bred Wethers, one shear	5	3	2
				30
				£372

¹ Cross-bred Wethers must be the offspring of any Whitefaced or Short-Woolled Tup with Blackfaced Ewes, or the progeny of Blackfaced Tups with Whitefaced or Short-Woolled Ewes.

CLASS IV.—SWINE.

LARGE WHITE BREED.		Premiums.		
Section		1st.	2d.	3d.
		£	£	£
1. Boar .		5	3	1
2. Sow .		4	2	1
3. Three Pigs, not above 8 months old .		4	2	1
		£23		
WHITE BREED OTHER THAN LARGE.				
4. Boar .		5	3	1
5. Sow .		4	2	1
6. Three Pigs, not above 8 months old .		4	2	1
		23		
BLACK OR BERKSHIRE.				
7. Boar .		5	3	1
8. Sow .		4	2	1
9. Three Pigs, not above 8 months old .		4	2	1
		23		
		£69		

EXTRA STOCK.

Animals not included in the Sections for Competition may be exhibited as Extra Stock, and will receive Honorary Premiums when specially commended, as follows:—

CATTLE AND HORSES.

Very highly commended .	Medium Gold Medal.
Highly commended .	Minor Gold Medal.
Commended .	The Silver Medal.

SHEEP AND SWINE.

Very highly commended .	Minor Gold Medal.
Highly commended .	The Silver Medal.
Commended	Medium Silver Medal.

CLASS V.—POULTRY.

First Premium — ONE SOVEREIGN ; *Second Premium* — TEN SHILLINGS ; one Commended Ticket—in all the Sections of Poultry.

Aged Birds must have been hatched previous to, and Cockerels and Pullets in, 1891.

	Section	Section
DORKING— <i>Silver Grey</i>	1. Cock	2. Hen
	3. Cockerel	4. Pullet
DORKING— <i>Coloured</i>	5. Cock	6. Hen
	7. Cockerel	8. Pullet
COCHIN-CHINA	9. Cock	10. Hen
	11. Cockerel	12. Pullet
BRAHMAPOOTRA	13. Cock	14. Hen
	15. Cockerel	16. Pullet
SCOTCH GREY	17. Cock	18. Hen
	19. Cockerel	20. Pullet
HAMBURG	21. Cock	22. Hen
	23. Cockerel	24. Pullet
PLYMOUTH ROCK	25. Cock	26. Hen
	27. Cockerel	28. Pullet
MINORCA	29. Cock	30. Hen
	31. Cockerel	32. Pullet
LEGHORN	33. Cock	34. Hen
	35. Cockerel	36. Pullet
LANGSHAN	37. Cock	38. Pullet
	39. Cockerel	40. Pullet
ANY OTHER PURE BREED	41. Cock	42. Hen
	43. Cockerel	44. Pullet
GAME— <i>Black or Brown Reds</i>	45. Cock	46. Hen
	47. Cockerel	48. Pullet
GAME— <i>Any other Pure Breed</i>	49. Cock	50. Hen
	51. Cockerel	52. Pullet
BANTAMS— <i>Any Pure Breed</i>	53. Cock	54. Hen
	55. Cockerel	56. Pullet
DUCKS— <i>White Aylesbury</i>	57. Drake	58. Duck
	59. Drake (Young)	60. Duckling
DUCKS— <i>Rouen</i>	61. Drake	62. Duck
	63. Drake (Young)	64. Duckling
DUCKS— <i>Any other Pure Breed</i>	65. Drake	66. Duck
	67. Drake (Young)	68. Duckling
TURKEYS— <i>Any Pure Breed</i>	69. Cock	70. Hen
	71. Cock (Poult)	72. Hen (Poult)
GEESE— <i>Any Pure Breed</i>	73. Gander	74. Goose
	75. Gander (Young)	76. Gosling

Amount of Poultry Premiums, £114.

CLASS VI.—DAIRY PRODUCE.

Section	Premiums.		
	1st.	2d.	3d.
	£	£	£
1. Cured Butter, not less than 28 lb.	5	4	3
2. Powdered Butter, not less than 7 lb.	5	4	3
3. Fresh Butter, three 1-lb. rolls	5	4	3
4. Two Sweet-milk Cheeses, not less than 30 lb. each, made according to any method	10	5	3
	----- £54		

No Exhibitor to show more than one lot in any Section.

CLASS VII.—IMPLEMENTS.

No Trials of Implements to be held at this Show.

GENERAL REGULATIONS FOR COMPETITIVE TRIALS.

1. Implements to be entered with the Secretary on or before 25th May. Received in the Yard on Tuesday, 21st July, and till 5 o'clock on the afternoon of Monday 27th. Exhibited Tuesday, Wednesday, Thursday, and Friday, 28th, 29th, 30th, and 31st July.

2. The price as entered in the Catalogue must be held the same till after the trials are over.

3. Implements must be *bona fide* the manufacture of the exhibitor, and fitted together by him, but portions of the machine or other article exhibited for competition may be purchased from other works. Foreign makers may exhibit through their accredited agents.

4. The Premiums will not be awarded without thorough and exhaustive open and competitive trials.

5. The Directors shall have power to withhold the Prizes where there is not sufficient merit, or to apportion them as they think best.

Reference is made to the General Regulations for the terms on which other Implements and Machines may be exhibited at the Show.

CLASS VIII.—HIGHLAND INDUSTRIES AND FISHERIES.

Section	Premiums.	
	1st. £	2d. £ s.
1. Two Plaids, Native Wool, Hand-spun, Home-dyed, and Handloom-woven	2	1
2. Web, not less than 25 yards Tweed, Cheviot Wool, Hand-spun, Home-dyed, and Handloom-woven	3	2
3. Web, not less than 25 yards Tweed, Black-faced Wool, Hand-spun, Home-dyed, and Handloom-woven	3	2
4. Web, 25 yards Tweed, Light Texture, for Ladies' Dresses, Native Wool, Hand-spun, Home-dyed, and Handloom-woven	3	2
5. Web Harris Tweed, 25 yards, Home Wool and Manufacture	3	2
6. Six pair Stocking Hose, Hand-spun, Home-dyed, and Knitted by Exhibitor,—two pair plain Ribbed, two pair Diced Tartan, two pair Fancy	3	2
7. Twelve pair Socks of Black-faced Wool, Hand-spun, Home-dyed, and Knitted by Exhibitor	2	1
8. Twelve pair Socks of Cheviot Wool, Hand-spun, Home-dyed, and Knitted by Exhibitor	2	1
9. Web, not less than 25 yards, of Shetland Tweed, of Shetland Wool, Hand-spun, Home-dyed, and Handloom-woven	3	2
10. Fine White Shetland Shawl	2	1
11. Thick Coloured Shetland Shawl	2	1
12. Collection of not less than five Articles, of Native Wool, Hand-spun, Home-dyed, and Knitted by Exhibitor	2	1
13. Varieties of Yarn, not less than eight, Hand-spun, Home-dyed, and of Native Wool; 4 cuts of each colour	1	0 10
14. Six pair Stockings, Shop Wool, but Knitted by Exhibitor	1	0 10
	—	£51

ABSTRACT OF PREMIUMS.

GIVEN BY THE SOCIETY.

1. Cattle	£745	0	0
2. Horses	474	0	0
3. Sheep	372	0	0
4. Swine	69	0	0
5. Poultry	114	0	0
6. Dairy Produce	54	0	0
7. Highland Industries and Fisheries	51	0	0
8. Six Silver Medals to Breeders	4	4	0
9. Extra Stock, say	100	0	0
	£1983	4	0

GIVEN BY

1. Mr Macpherson Grant of Drum- duan	£24	0	0
2. Mr Smith of Ardtornish	20	0	0
3. The Clydesdale Horse Society	5	0	0
4. Lord Polwarth, ex-President of the Clydesdale Horse Society	21	0	0
5. Captain Clayhills Henderson of Invergowrie	25	0	0
6 Tweeddale Gold Medal	20	0	0
	115	0	0
	£2098	4	0

F. N. MENZIES, *Secretary.*3 GEORGE IV. BRIDGE,
EDINBURGH, 1st April 1891.

APPENDIX (C).

LIST OF MEMBERS

OF

THE HIGHLAND AND AGRICULTURAL
SOCIETY OF SCOTLAND

ARRANGED ACCORDING TO COUNTIES
AND SHOW DISTRICTS

1891

By the Charter of 1834 the Society consists of two classes, Ordinary and Honorary or Corresponding Members. The number of Honorary or Corresponding Members resident in the United Kingdom must not exceed twenty, but with power to the Society to elect as Honorary Associates persons resident abroad, not subjects of her Majesty, who may have been benefactors to the Society, or who are distinguished for their skill in Art or Science, provided that the number of such Foreign Associates shall not exceed twenty.

By a Bye-law passed in 1873, with reference to the Supplementary Charter of 1856, successful Candidates for the Society's Agricultural Diploma are thereby eligible to be elected free Life Members of the Society.

Candidates for admission to the Society must be proposed by a Member, and are elected at the half-yearly General Meetings in January, and June or July, but it is not necessary that the proposer should attend the meeting.

The Ordinary Subscription is £1, 3s. 6d. annually, which may be redeemed by one payment, varying according to the number of previous annual payments, from £7, 1s. to £12, 12s. Proprietors farming the whole of their own lands, whose Rental on the Valuation Roll does not exceed £500 per annum, and all Tenant Farmers, Secretaries or Treasurers of Local Agricultural Associations, Factors Resident on Estates, Land Stewards, Foresters, Agricultural Implement Makers, and Veterinary Surgeons, none of them being also owners of land to an extent exceeding £500 per annum, are admitted on a subscription of 10s. annually, which may be redeemed by one payment, varying according to the number of previous annual payments, from £3 to £5, 5s. Subscription payable on election, and afterwards annually in January.

According to the Charter, a Member who homologates his election by paying his first subscription cannot retire until he has paid, in annual subscriptions, or otherwise, an amount equivalent to a life composition—namely, £12, 12s., or £5, 5s. Members having Candidates to propose are requested to state whether the Candidate should be on the £1, 3s. 6d. or 10s. list.

Members of the Society receive the 'Transactions' free on application, and are entitled to consult the Chemist and Botanist at reduced rates—to apply for District Premiums—to report Ploughing Matches for the Medal—to free admission to the Show-Yard, and to exhibit Stock and Implements at reduced rates. Firms are not admitted as Members, but if one partner of a firm becomes a Member, the firm is allowed to exhibit at Members' rates.

Members having Candidates to propose are requested to send their names to FLETCHER NORTON MENZIES, Esq., 3 George IV. Bridge, Edinburgh.

The Members marked * have been Presidents, and † Vice-Presidents.

By a Resolution of the Directors, 2d February 1887, the list of Members, arranged according to Counties, has been so made up that no Member shall vote in more than one Show District for the nomination of Directors. Members finding any mistakes are requested to report the same to FLETCHER NORTON MENZIES, Esq., 3 George IV. Bridge, Edinburgh.

The following is the List of Counties constituting the Show Districts :—

	PAGE
1. Glasgow, for the Counties of Argyll, Ayr, Bute, Lanark, and Renfrew,—	
Argyll	5
Ayr	7
Bute	8
Lanark	8
Renfrew	11
2. Perth, for the Counties of Fife, Forfar (Western Division), Kinross, and Perth (Eastern Division),—	
Fife	12
Forfar (Western Division)	14
Kinross	15
Perth (Eastern Division)	16
3. Stirling, for the Counties of Clackmannan, Dumbarton, Perth (Western Division), and Stirling,—	
Clackmannan	19
Dumbarton	19
Perth (Western Division)	20
Stirling	21
4. Edinburgh, for the Counties of Edinburgh, Haddington, and Linlithgow,—	
Edinburgh	23
Haddington	27
Linlithgow	28
5. Aberdeen, for the Counties of Aberdeen, Banff, Forfar (Eastern Division), and Kincardine,—	
Aberdeen	30
Banff	32
Forfar (Eastern Division)	33
Kincardine	34

6. Dumfries, for the Counties of Dumfries, Kirkcudbright, and Wigtown,—

Dumfries	35
Kirkcudbright	37
Wigtown	38

7. Inverness, for the Counties of Caithness, Elgin, Inverness, Nairn, Orkney and Shetland, Ross and Cromarty, and Sutherland,—

Caithness	40
Elgin	40
Inverness	41
Nairn	42
Orkney and Shetland—	
Orkney	42
Shetland	43
Ross and Cromarty	43
Sutherland	44

8. Border District, for the Counties of Berwick, Peebles, Roxburgh, and Selkirk,—

Berwick	45
Peebles	46
Roxburgh	46
Selkirk	48

England	49
Ireland	52
Foreign Countries	52
Members whose Residences are unknown	53
Honorary Members	57
Honorary Associates	57
Free Life Members	57

LIST OF MEMBERS

ARRANGED ACCORDING TO COUNTIES AND SHOW DISTRICTS.

Her Most Gracious Majesty THE QUEEN.

Admitted

1872

* His Royal Highness The PRINCE OF WALES.

1873

1.—GLASGOW DISTRICT.

EMBRACING THE

COUNTIES OF ARGYLL, AYR, BUTE, LANARK, AND RENFREW.

ARGYLL.

Admitted

- 1857 Aitken, Robert, Drumore, Campbeltown
- 1881 Allan, Alex., of Aros, Tobermory
- 1875 Allan, Robt., Glenmore, Lochgilphead
- 1852 Allan, T. W. M., of Glenfeochan, Oban
- 1889 Anderson, Wm. D., Ardsheal, Ballachulish
- 1889 Andrew, David, Knockstaple, Campbeltown
- 1844*†ARGYLE, The Duke of, K G., Inveraray Castle, Inveraray
- 1881 Ballingall, J. S. R., Eallabus, Islay
- 1882 Black, Donald, junior, Clachan, Lochfynehead, Inveraray
- 1884 Boyd, Wm., Killundine, Oban
- 1873 Brown, Alexander, Banker, Oban
- 1875 Bruce, Henry, of Ederline, Lochgilphead
- 1881 Buchanan, Dr Alexander, Tiree, Tobermory
- 1881 Buchanan, Angus, Druimnatoran, Strontian
- 1858 Buchanan, Dun., Auchinbreck, Colintrave
- 1889 Cameron, Allan Gordon, of Barcaldine Castle, Taynuilt
- 1871 Cameron, John, Fassifern, Fort-William
- 1837 Campbell, Alex., of Achendarroch, Lochgilphead
- 1865 Campbell, Lt.-Col., of South Hall, Colintrave
- 1858 Campbell, Admiral, of Barbreck, Lochgilphead
- 1889 Campbell, Alex. James Henry, of Dunstaffnage, Oban
- 1891 Campbell, Donald, of Balliveolan, Ledaig
- 1875 Campbell, Capt. D., of Inverneil and Ross, Ardrishaig
- 1882 Campbell, Edward P., Captain, 42d Highlanders, South Hall, Colintrave, Greenock

Admitted

- 1885 Campbell, Lt.-Col. H. Burnley, of Ballimore, Tigh-na-bruaich
- 1883 Campbell, James, of Jura, Greenock
- 1888 Campbell, James, Shanvallie, Ledaig
- 1877 Campbell, James, Succoth Villa, Lochgilphead
- 1874 Campbell, John, of Kilberry, Tarbert
- 1877 Campbell, John, Glenforsa, Aros, Mull
- 1890 Campbell, Robt. C. Graham, of Shirvan, Lochend Lodge, Ardrishaig
- 1882 Carmichael, Peter, Cladville, Bridgend, Islay
- 1877 Clark, Andrew, Islay
- 1869 Clark, Archd., Bencorrum, Dunoon
- 1853 Clark, Archibald, Inverchapple, Kilmun
- 1867 Clark, Lachlan, Tangy, Campbeltown
- 1889 Clark, Robert, Skerobling, Campbeltown
- 1871 Clark, Wm., Stronchreggan, Fort William
- 1872 Colthart, Robert, Achateny, Ardgour
- 1883 Cordner, Alex., Machriemore, Southend
- 1885 Corson, Thomas, Auction Mart, Oban
- 1882 Craig, Hugh, Ardoran, Oban
- 1884 Crerar, Peter C., Brackley, Dalnally
- 1889 Cunningham, Robert, Kilkivan, Campbeltown
- 1884 Dick, John P., Killelan House, Campbeltown
- 1867 Dickie, Robt., Killeonan, Campbeltown
- 1882 Douglas, J., Macharioch, Southend, Campbeltown
- 1878 Duncan, Alex., Duart, Auchnacraig, Mull
- 1881 Duncan, R., Royal Hotel, Tigh-na-bruaich
- 1884 Elliot, Walter, Ardtornish, Oban
- 1885 Finlay, C. Campbell, of Castle Toward, Greenock
- 1870 Finlay, Kirkman, of Dunlossit, Islay
- 1870 Fletcher, B. J. C., Dunans, Colintrave

Admitted

- 1874 Forsyth, James N. M., of Quinish, Tobermory
 1884 Fraser, Duncan, Hotel, Dalnally
 1867 Gardyne, Col. C. G., of Glenforsa, Mull
 1889 Gemmell, John, Dalrioch, Campbeltown
 1875 Gillespie, John, Temperance Hotel, Oban
 1891 Graham, Archd. W., Erray, Tobermory
 1889 Graham, Robt. C., of Skipness, Whitehouse
 1888 Graham, William, of North Erines, Tarbert (6 Royal Crescent, Glasgow)
 1872 Grant, A., Cuil House, Inveraray
 1873 Hall, Allan, Degnish, Ardmaddy, Easdale, Oban
 1875 Hall, Jas. M., Killeen House, Tayinloan
 1865 Hay, C., Ardbeg, Islay
 1882 Holm, Alex., Ballimore, Kilnichael, Lochgilphead
 1853 Hosack, William, Oban
 1889 Hunter, James, Machribeg, Campbeltown
 1857 Hunter, William, Machribeg, Campbeltown
 1889 Kinloch, Chas., Ballymeanach, Lochawe
 1850 Lamont, James, of Knockdow, Greenock
 1875 Lloyd, T., of Minard Castle, Inveraray
 1869 LORNE, The Marquis of, K.T.
 1883 Lothian, James, Campbeltown
 1862 Macarthur, John, Banker, Inveraray
 1872 McCallum, Dun., Clennachrie, Oban
 1861 McCallum, John, Westbourne, Kilm
 1879 McCall, Duncan, Clachan House, Lismore, Oban.
 1885 McCulloch, Allan, Kilbride, Glenfeochan, Oban
 1881 Macdiarmid, H., Island House, Tiree, Oban
 1882 Macdiarmid, Robert, Castles, Lochawe
 1874 Macdonald, Alex., Nether Largie, Lochgilphead
 1889 Macdougall, Allan, Duntanachan, Taynult
 1872 McDougall, Col. Chas. A., of Dunollie, Oban
 1888 Macfarlane, James, Craignish, Lismore, Oban
 1873 Macfarlane, Lewis, Invermay, Lochgoilhead
 1889 McGee, William, Carnasriemore, Kilmartin
 1863 McGibbon, David, Ardnacraig, Campbeltown
 1870 MacGregor, Donald, of Ardgartan, Glenecro (Royal Hotel, Edinburgh)
 1883 MacGregor, Donald, Solicitor, Oban
 1844 MacIntyre, J., Lochvoil Cottage, Oban
 1877 Mackay, A. F., Carskey House, Campbeltown
 1880 McKeand, P., Scour, Bunessan, Mull
 1855 McKechnie, Neil, Inveraray
 1869 MacKechnie, Jas., Blarreen House, Taynult
 1878 Mackellar, John, Crossaig, Tarbert
 1878 Mackellar, Peter, Crossaig, Tarbert
 1872 Mackenzie, John, of Knapoch, Oban
 1857 McKerral, A., Brunerican, Campbeltown
 1876 MACKINNON, Sir Wm., of Balaakill, Bart., Clachan, Kintyre
 1874 McLachlan, D., Lochgilphead
 1886 McLachlan, J., of McLachlan, Inveraray (12 Abercromby Place, Edinburgh)
 1870 MacLaine, M. G., of Lochbuie, Oban
 1888 McLaren, Dun., Banker, Tarbert, Lochfyne
 1875 McLatchie, W., Ballygreggan, Campbeltown
 1875 McLean, A. J., of Pennycross, Oban
 1849 Macleod, John N., of Kintarbert, Glen-saddell, Campbeltown
 1848 Macneal, H., of Ugadale, Campbeltown

Admitted

- 1860 M'NEILL, Maj.-Gen. Sir J. C., of Colonsay, V.C., K.C.M.G., K.C.B.
 1876 M'Nicol, John, Achandarroch, Ballachulish
 1882 M'Phail, John, Scallasdale, Mull
 1891 Macpherson, Colin D., Corpach, Fort William
 1883 Macpherson, James, Maam, Inveraray
 1891 M'Vean, Colin A., Kilfinichen, Pennyghael, Mull
 1878 Malcolm, Wm. M., Auchnacraig House, Mull
 1874 Masson, John, Tobermory
 1881 Maxwell, Wm., Baraskomel, Campbeltown
 1891 Meikle, R. A., Ri-Cruin, Lochgilphead
 1874 Menzies, John, the Hotel, Banavie
 1861 Mercer, John, Ardnadam, Sandbank
 1889 Mitchell, Archibald, Clockiel, Campbeltown
 1857 Mitchell, Jas., Craigs, Campbeltown
 1889 Mitchell, James B., Aros, Campbeltown
 1850 Mitchell, J., Lochend, Campbeltown
 1855 Morrison, Charles, of Islay, Bridgend
 1877 Munro, D. H. C., of Kenlochlaich, Appin
 1888 Munro, John, Ironmonger, Oban
 1888 Mutter, Major J. M., of Bunanuig (1 Ashgrove Ter., Partickhill, Glasgow)
 1888 Nicolson, Neil, Auchgoyle, Tigh-na-bruaich
 1883 Oliver, James, Benbui, Inveraray
 1887 Orde, Colin Campbell, Kilmory, Lochgilphead
 1858 ORDE, Sir John W. P. C., of Kilmory, Bait
 1882 Patton, James, Gallanach, Oban
 1870 Pollok, John, of Ronachan, Clachan
 1889 Ralston, Gav., Kilmichael, Campbeltown
 1856 Ramsay, John, of Kildalton, Port Ellen
 1882 Reid, Peter, Fort Ellen, Islay—*Free Life Member*
 1882 Robertson, Jas. J., Kinloch, Morvern, Oban
 1884 Robertson, John, Craig Farm, Dalnally
 1891 Routledge, Joseph, Annat, Fort William
 1891 Shairp, Alex., Land Agent and Architect, Oban
 1884 Shankland, Wm., Killicheran, Lismore
 1884 Smith, T. V., of Ardnornish, Oban
 1881 Smith, W. Anderson, Ledaig
 1881 Sproat, George B., Writer, Tobermory
 1881 Sproat, Wm., Procurator-Fiscal, Tobermory
 1875 Stevenson, A. S., of Ach-na-cloich, Connell
 1879 Stewart, Rev. A. M., Inverchaolain, Greenock
 1863 Stewart, Com. D., R.N., Knockrioch, Campbeltown
 1881 Stewart, John Lorne, of Coll, Oban
 1871 Stewart, Capt. J. C., of Fasnacloich, Ledaig
 1858 Stewart, Robt., of Kinlochmoidart, Salen (8 Rothesay Terrace, Edinburgh)
 1850 Stewart, Wm., Tonreoch, Campbeltown
 1889 Sutherland, John D., Oban
 1891 Thomson, Duncan, Invernye, Tigh-na-bruaich
 1875 Turner, A., Kilchamaig, Whitehouse, Kintyre
 1853 Turner, D., Corachaive, Sandbank
 1883 Webster, G. K., of Invercran, Ledaig
 1882 Weir, Alexander, Gallowhill, Campbeltown
 1876 Whyte, D. C., Ballymore, Sandbank
 1853 Whyte, John, Ballochyle, Sandbank
 1865 Wilson, Peter, Linsag, Tigh-na-bruaich
 1863 Wyllie, James, Factor, Inveraray
 1887 Young, William, Drum, Campbeltown

AYR.

Admitted

- 1882 AILSA, The Marquis of, Culzean Castle, Maybole
 1867 Allan, Andrew, Munnoch, Dalry, Ayr
 1883 Allan, Gavin, Whiteleahill, Newmilns
 1882 Alston, George, Loudoun Hill, Darvel
 1890 Alston, H. R., Swindrige Muir, Dalry
 1877 Baxter, David, Ladyburn, Maybole
 1850 BLAIR, Sir E. H., of Blairquhan, Bart., Maybole
 1882 Bone, William, Shalloch Park, Girvan
 1865 Boyd, Col. J. Hay, of Townend, Symington, Kilmarnock
 1890 Brisbane, C. T., of Brisbane, Largs
 1866 Brown, David, Banker, Maybole
 1865 Brown, James, Whimpark, Kilmarnock
 1877 Brown, John, Lissensmoss, Kilwinning
 1870 Bruges, Edward C., Dalgic, New Cumnock
 1889 Caldwell, John, Bogside, Dundonald
 1853 Campbell, Col. Chas. V. H., of Nether Place, Mauchline
 1887 Campbell, W. R. H., of Nether Place, Mauchline
 1857 Clark, William, Shawhill, Monkton
 1877 Cochran, James, Eglinton Hotel, Dalmellington
 1870 Craig, Daniel, Springfield, Mauchline
 1857 Craig, John, Guelt, Cumnock
 1882 Craig, Robert, Ryesholm, Dalry
 1865 Crawford, J., Milnstonford, W. Kilbride
 1850 Cunningham, D., Chapelton, Ardrossan
 1880 CUNNINGHAME, Sir W. M., of Corsehill, Bart., Glenmore House, Maybole
 1859 Cunningham, W. C. S., of Caprington, Kilmarnock
 1857 Deans, J. Y., of Kirkstyle, Kilmarnock
 1889 Dempster, Jas. K., yr. of Ladyton, Stoneyhall, Galston
 1857 Drennan, James, Auchinlee, Ayr
 1890 Drummond, Hugh, Craighead of Rodinghead, Mauchline
 1887 Dunlop, And. T. L., Morriston, Maybole —*Free Life Member*
 1869 Dunlop, Gabriel, Castle Farm, Stewarton
 1875 Dunlop, Quintin, Morriston, Maybole
 1871 Dunlop, Robert, Aulton, Kilmaurs
 1889 Dunlop, Wm. Hamilton, of Doonside, Ayr
 1863 EGLINTON and WINTON, The Earl of, Eglinton Castle, Irvine
 1889 FERGUSON, John Blackburn, Doonholm, Ayr
 1854 FERGUSON, Right Hon. Sir James, of Kilkerran, Bart., M.P., Maybole
 1875 Foulds, A. R., of Clerkland, Stewarton
 1885 Gemmell, Andrew, Lugton Ridge, Beith
 1875 Gemmell, G. C., Upper Whitehaugh, Muirkirk
 1875 Gilmour, Alex., Annfield House, Irvine
 1875 Gilmour, James, Orchardton, Cumnock
 1881 GLASGOW, The Earl of, Kilburne, Fairlie
 1874 Glasgow, R. B. R., of Montgreenan, Kilwinning
 1884 Guthrie, Wm., Crossburn, Troon
 1890 Hamilton, Claude, Carbieston, Ayr
 1853 Hamilton, Hugh, of Pinmore, Ayr
 1865 Hamilton, J., Wallace Bank, Kilmarnock
 1839 Hamilton, Lieut.-Col. John, of Sundrum, Ayr
 1887 Hamilton, John W., of Cairnhill, Kilmarnock
 1889 Hannah, John M., Girvan Mains, Girvan
 1878 Hay, J. F. Dalrymple, Dunlop House, Dunlop
 1876 Hayman, J., Dumfries House Mains, Cumnock
 1874 Henderson, Richard, Portland Estates Office, Kilmarnock—*Free Life Member*
 1889 Herron, Thos., Trees, Maybole

Admitted

- 1879 Holmes, Wm., Fullerton Street, Irvine
 1865 Houldsworth, Henry, Carrick House, Ayr
 1865 Houldsworth, J. M., Ayr
 1857 Houldsworth, Wm., Mount Charles, Ayr
 1876 Howatson, W. M. S., Carskeoch, Patna
 1865 Howatson, Chas., House of Glenbuck, Glenbuck
 1886 Howie, James, Burnhouses, Kilmarnock
 1857 Howie, John, Hurlford, Kilmarnock
 1889 Howie, Thomas, Orangefield, Monkton
 1867 Hunter, David, Guiltreehill, Maybole
 1878 Hunter, Thomas, Implt. Maker, Maybole
 1859 Hyndman, Henry C., of Springside, West Kilbride
 1877 Inglis, Robert, Loveston House, Girvan
 1885 Johnstone, James, Alloway Cottage, Ayr
 1870 Kennedy, William, Claremont, Ayr
 1874 Kennedy, William, Bankinton, Patna
 1869 Kerr, James, Lochend, Kilbirnie
 1875 Kerr, William, Newhouse, Dalry
 1882 Kilpatrick, Jas., Craigie Mains, Craigie
 1873 Latta, William, Darnalloch, Cumnock
 1865 Lindsay, John, of Fulshaw, Stewarton
 1878 Lindsay, Thomas, Townend, Craigie
 1889 Littlejohn, James, Gnoch, Ayr
 1874 M'Connell, Wm., of Knockdolian, Girvan
 1887 M'Jannet, Archibald C., Irvine
 1882 M'Kerrell, R. M., of Hillhouse, Dundonald
 1878 M'Kersie, J., Cunningham House, Muirkirk
 1857 Mackie, Rob., Draffen House, Stewarton
 1886 M'Min, Thos. M'C., Wellwood, Muirkirk
 1882 Marshall, Francis, of Park, Girvan
 1877 Marshall, John, Implt. Maker, Maybole
 1875 Martin, Donald T., of Girsenti, Irvine
 1858 Meikle, Jas., Fichon, Dalry, Ayr
 1886 Muddlemas, Wm., Solicitor, Kilmarnock
 1882 Montgomery, Rob., Lessnessock, Ochiltree
 1889 Montgomery, John, Meadowhead, West Kilbride
 1889 Murdoch, Alex., Auchensflower, Ballantrae
 1889 Murdoch, James, Burnton, Dalrymple, Ayr
 1857 Murray, J., Dumfries Arms Hotel, Cumnock
 1884 Niven, Richard, 3 Park Terrace, Ayr
 1890 Osborne, Robert, Drumjoan, Ochiltree
 1876 Oswald, Rich. A., of Auchinverrie, Ayr
 1888 Paton, Hugh (W. Samson & Co.), Kilmarnock
 1857 Picken, James, Laigh Langside, Craigie
 1881 Pollock, A., Mauchline
 1889 Pollock, R. M., Middleton, Ayr
 1876 Rankine, Alex. M., Lochlands, Maybole
 1857 Rodger, Hugh, Hillhead, Kilmarnock
 1882 Scott, C. W., Hawkhill, Largs
 1890 Scott, John, C. B., of Hawkhill, Largs
 1872 Shaw, Chas. G., Ayr
 1888 Skeoch, Peter, Boydston, Beith
 1870 Sloan, John, Alton Albany, Barr, Girvan
 1869 Sloan, Wm., Breryside, Monkton
 1889 Smith, Robert, Shields, St Quivox, Ayr
 1880 Smith, Thomas, The Castle, Maybole
 1882 Somervell, James, of Sorn, M.F., Mauchline
 1887 Somerville, Wm., Hayland Mills, Dunlop
 1879 Speir, Robert, Blairpark, Dalry
 1888 Steel, Matt., Netherton, Old Cumnock
 1885 Steel, Alex., Burnhead, Newmilns
 1887 Steele, Daniel, Merkland, New Cumnock —*Free Life Member*
 1889 Steven, Hugh, Skeldon House, Dalrymple
 1885 Stevenson, Allan, Architect, Ayr
 1888 Stevenson, David, Silverwood, Kilmarnock
 1885 Stevenson, David, Auchengate, Troon

Admitted

- 1888 Stevenson, John, Balig, Ballantrae
 1864 Stevenson, John, Changue, Cumnock
 1885 Stewart, James, of Garvoch, Largs
 1858 Stewart, James, Heathfield, Irvine
 1882 Stuart, A., Muirhouse, Symington, Kilmarnock
 1876 Taylor, H., Kamishill, Hurlford, Kilmarnock
 1882 Thornycroft, J. B., Portland Iron Works, Hurlford
 1886 Tivendale, William, Cessnock, Galston
 1884 Turner, J. H., Portland Estates Office, Kilmarnock
 1867 VERNON, Hon. G. R., M.P., Auchans House, Kilmarnock
 1887 Wallace, H. R., Cloncaird Castle, Maybole
 1886 Wallace, James, Piperhill, Ochiltree
 1875 Wallace, Robert, Auchebraun, Mauchline
 1874 Wardrop, Robert, Garlaff, Cumnock
 1864 Watson, John, Kilmarnock
 1868 Weir, W., of Kildonan, Portland Iron Works, Kilmarnock
 1889 Whyte, Robert, East Raws, Kilmarnock
 1882 Willison, Alex., Easterhill, Dalry
 1873 Willison, George, Woodbank, Dailly
 1858 Wilson, James, Banker, Kilmarnock
 1882 Wright, R. P., Downan, Ballantrae—
Free Life Member
 1884 Wyllie, Alex., Holmbyre, Ardrossan
 1868 Young, John, jun., Ayr

BUTE.

- 1855 Allan, James, Clachlands, Lamslash
 1870 Allan, James, jun., Balnacole, Brodick
 1889 Anderson, Francis, Bute Estate Office, Rothesay
 1869†BUTE, The Marquis of, K.T., Mount Stuart, Rothesay
 1889 Dickie, Wm. P., Cranslagvourty, Rothesay
 1889 Duncan, Chas., Little Kilmory, Rothesay
 1875 Duncan, Jas., Bannatyne Mains, Rothesay
 1889 Gilnour, Thomas, Kilchattan Tile Works, Rothesay
 1865†HAMILTON and BRANDON, The Duke of, K.T., Brodick Castle, Arran
 1888 Lyon, George, Kildavaig, Ardlamont, Greenock
 1889 M'Alister, Robert, Mid Ascog, Rothesay
 1889 MacAlister, James, Meikle Kilmory, Rothesay
 1861 Macdonald, P., The Douglas Hotel, Brodick
 1889 Macfie, Hugh, Ballycaul, Rothesay
 1889 Macfie, John, Lubas, Rothesay
 1875 M'Intyre, Daniel, Dunalund, Rothesay
 1881 M'Intyre, Wm., Mount Stuart, Rothesay
 1878 Mackay, Arch. M., Bruchag, Rothesay
 1876 M'Pherson, Don., Queen's Hotel, Rothesay
 1878 Murray, Patrick, Strabane, Brodick
 1882 Robertson, Robert, Breakough, Millport
 1891 Stuart, J. Windsor, Rothesay
 1870 Tod, James, Glenkill, Lamslash
 1864 Tod, William, Glenree, Lamslash
 1887 Wallace, John, Glenkill, Lamslash

LANARK.

- 1875 Addie, John, Viewpark, Uddingston
 1857 Aikman, Thomson, Glasgow
 1882 Aikman, Thomson, jun., Glasgow
 1875 Alexander, Jas., 145 North Street, Glasgow

Admitted

- 1864 Allan, Alex., Waddiefield, Hamilton
 1884 Allan, David, Clarkston, Busby
 1877 Allan, James, Kirklands, Dolphinton
 1850 Alston, John P., of Muirburn, Strathaven
 1870 Andrew, W. J., Banker, Coatbridge
 1872 ANSTRUTHER, Sir W. C. J. C., of Carmichael, Bart., Thankerton
 1875 BAIN, Sir J., 8 Park Terrace, Glasgow
 1864 Bain, James, Bank of Scotland, Glasgow
 1887 Bain, W. P. C., Lochrin Iron Works, Coatbridge
 1878 Baird, Arch., 67 Robertson St., Glasgow
 1875 Baird, Hugh, jun., Rosslyn House, Kelvinside, Glasgow
 1886 Barr, Duncan C., Factor, Hamilton
 1862 Barr, James, jun., Whiteshaw, Carluke
 1882 Beckitt, C. R., Rockvilla Oil Mills, Port Dundas
 1877 Beith, Gilbert, 7 Royal Bank Place, Glasgow
 1876 Bell, William, Sheriffhalls, Thankerton
 1882 Bertram, A. D., Kersowell, Carnwath
 1852 Bertram, Wm., of Kersowell, Carnwath
 1882 Bertam, Wm., yr. of Kersowell, Carnwath
 1887 Blackie, Alfred, 97 East Milton Street, Glasgow
 1881 Brock, H., V.S., 112 North Street, Glasgow
 1878 Brown, James, of Orchard, Carluke
 1882 Brown, John, Shields, East Kilbride
 1857 Brown, John, Biggar
 1849 Brown, T., Weston, Dunsyre, Dolphinton
 1877 Brownlie, R., Bogside, Newnains, Carluke
 1875 Brownlie, T., New Club, Glasgow
 1849 Buchanan, Lieut.-Col. Carrick, C.B., of Drumpellier, Coatbridge
 1876 Buchanan, Capt. J. R. G., of Scotstone, Eastfield House, Cambuslang
 1875 Bullock, Matt., 11 Park Circus, Glasgow
 1884 Cadzow, Robert, Borland, Biggar
 1874 Campbell, John, 88 West Regent Street, Glasgow
 1858 Campbell, William, Solicitor, Hamilton
 1877 Cathcart, J. P., 135 Buchanan St., Glasgow
 1849 Chancellor, J. G., of Shieldhill, Biggar
 1882 Chapman, Wm., Meadowhead, Airdrie
 1857 Christie, T. C., of Bedley, Chryston
 1889 Clark, Alexander, Todlaw, Lesmahagow
 1887 Clark, James, 401 Parliamentary Road, Glasgow
 1881 Clark, W. A., Cruthersland, East Kilbride
 1869 Clarke, John, Hamilton
 1879 Clarkson, Alex., Pretts Mills, Thankerton
 1888 Clement, And., Cheese Merchant, Glasgow
 1850 Clouston, Peter, 1 Park Ter., Glasgow
 1890 COLEBROOKE, Sir Edward, of Crawford, Bart., Abington
 1871 Comrie, Alex., 12 Colebrooke Street, Hillhead, Glasgow
 1876 Coubrough, Wm., Sornfallow, Wiston, Biggar
 1873 Cowan, Jas., 23 St Vincent Pl., Glasgow
 1880 Craig, James, Robroyston, Bishopbriggs
 1888 Craig, John, High Ploughland, Strathaven
 1882 Craig, John, of Bellsfield, Blantyre
 1867 Craig, John, Jellyhill, Bishopbriggs
 1885 Craig, John, South Halls, Strathaven
 1889 Craig, James, Raith View, Hamilton Drive, Bothwell
 1884 Cranston, Stuart, 28 Buchanan Street, Glasgow
 1882 Crawford, Alexander, Netherton, Carmunnock

Admitted

1864 Cunningham, John M., Glasgow
 1882 Cunningham, T. D. S., Auchlochan, Lesmahagow
 1860 Dalziel, George, Goldieale, Uddingston
 1870 Davidson, Hugh, of Braedale, Lanark
 1886 Denholm, Alex., Springfield, Biggar
 1857 Dondrell, George J., Crosshill Farm, Rutherglen
 1889 Douglas, Rev. Sholto Douglas Campbell, of Douglas Support, Coatbridge
 1875 Duff, J., Factor, Blackwood, Lesmahagow
 1883 Duncan, J. Dalrymple, 211 Hope Street, Glasgow
 1876 Dunlop, C. R., of Quarter, Hamilton
 1880 Dunn, Richard, Udston, Hamilton
 1869 Dykes, J., jun., 92 St Vincent Street, Glasgow
 1887 Dykes, Thomas, Bent, Lesmahagow
 1887 Elliot, William, Auction Mart, Lanark
 1884 Ferguson, Alex., 300 Duke St., Glasgow
 1884 Findlay, John, Springhill, Bailieston
 1888 Findlay, John, Warrenhill, Thankerton
 1855 Findlay, Rob., of Springhill, Bailieston
 1847 Findlay, T. D., Bonnington, Lanark
 1857 Findlay, W., Brackenbrae, Bishopbriggs
 1861 Fleming, Alex., Raith, Bothwell
 1862 Fleming, Andrew, Calla, Carnwath
 1867 Fleming, David, Avonmull, Hamilton
 1888 Fleming, David, Castleton, Carmunnock
 1882 Fleming, James, Muirside, Carmunnock
 1877 Fleming, John, Ploughland, Strathaven
 1870 Fleming, J., Meadowbank Cot., Strathaven
 1876 Fleming, J. B., of Beauchfield, Glasgow
 1882 Fleming, Wm., Windlaw, Carmunnock
 1857 Forrest, David, of Treesbanks, Shotts
 1867 Forrest, J. C., of Auchentraith, Hamilton
 1863 Forrest, Peter, of Hairmyres, Shotts
 1888 Fowler, John, 4 Kelvinbank Ter., Sandyford, Glasgow
 1877 French, James, Mountherrick, Abington
 1867 Frew, Thos., 6 Windsor Terrace, Glasgow
 1868 Gardner, Chas., Union Bank, Glasgow
 1872 Galbraith, W. W., Croftfoot, Gartcosh
 1857 Garden, William, Hardgate, Govan
 1888 Garioaway, Wm., 694 Duke St., Glasgow
 1875 Gemmell, John, Glespinside, Douglas
 1878 Gibb, John, Tarbrax, Carnwath
 1871 Gibson, J., 54 Abbotsford Pl., Glasgow
 1891 Gilchrist, John, Orbiston Mains, Bells-hill, Glasgow
 1884 Gillespie, Wm., Gateside, Douglas
 1877 Gillies, Wm., Shawlands House, Glasgow
 1849 Gilmour, Allan, of Eaglesham, Glasgow
 1888 Gilmour, Allan, yr. of Eaglesham, Glasgow
 1882 Gilmour, Arthur, Crosshill, East Kilbride
 1877 Goff, Dr Bruce, Woodlea, Bothwell
 1887 Goodwin, John, Clydeview, Motherwell
 1882 Graham, Thomas, 40 St Enoch Square, Glasgow
 1873 Grahame, Jas., Western Club, Glasgow
 1887 Grant, Henry O. Ogilvie, 53 Miller St., Glasgow
 1876 Gray, John, 181 Renfrew Street, Glasgow
 1867 Greenshields, J., West Town, Lesmahagow
 1868 Guild, James Wyllie, C.A., Glasgow
 1884 Haddow, Robt., Cold Chapel, Abington
 1875 Hamilton, Gavin, of Auldtown, Lesmahagow
 1889 Hamilton, Gavin, jun., B. L. Co. Bank, Lesmahagow
 1869 Hamilton, James, Woolfords, Carnwath
 1857 Hamilton, of Dalzell, Lord, Dalzell, Motherwell
 1877 Hamilton, Thomas, Poniel, Douglas
 1883 Hamilton, William, High Motherwell, Motherwell

Admitted

1889 Hardie, David, Sub-Factor, Dalzell, Motherwell
 1852 Harvie, Rev. W., of Brownlee, Carluke
 1862 Hendrie, John, 74 Bath Street, Glasgow
 1865 Hendrie, John, Newton, Newton, N.B.
 1868 Houldsworth, Jas., of Coltness, Wishaw
 1857 Houldsworth, Joseph Henry, Glasgow
 1872 Houldsworth, W. J., Coltness House, Wishaw
 1862 Hozier, Sir W. W., of Newlands and Mauldslic Castle, Bart., Carluke
 1869 Hunter, William, Craighead, Abington
 1873 Imrie, John L., Blackhill, Maryhill
 1878 Inch, John, Howburn, Walston, Biggar
 1870 Inch, Thomas, Gilkerscleuch, Abington
 1884 Inglis, David, 145 St Vincent Street, Glasgow
 1855 Jack, Robt., Banker, Motherwell
 1857 Jeffray, John, Cardowan House, Millerston
 1876 Johnston, James, Pather Farm, Wishaw
 1878 Johnston, Jas., Lochburnie, Maryhill
 1888 Kennedy, Hugh, Contractor, Partick
 1888 Kerr, James, New Mains, Douglas
 1875 Kisdson, Richard, 81 Great Clyde Street, Glasgow
 1869 King, Robert, Levernholm, Hurler
 1882 Lambert, Andrew, Sunnyside Works, Coatbridge
 1884 LAMINGTON, Lord, Lamington House
 1881 Lang, Hugh, 11 Kew Terrace, Hillhead, Glasgow
 1864 Latta, M. R., Carmyle, Tollcross, Glasgow
 1878 Lindsay, Hugh, Meadowflat, Thankerton
 1872 LOCKHART, Sir S. M., of Lee and Carnwath, Bart.
 1884 Lockhart, Major-General Graeme, of Castlehill, C.B., Cambusnethan House, Wishaw
 1874 Love, Jas., 12 St James Street, Paisley Road, Glasgow
 1868 McCall, Prof. J., Veterinary College, Glasgow
 1846 McCall, Henry, of Daldowie, Glasgow
 1860 Macfarlane, Donald, Balmuldy, Bishopbriggs
 1884 McFarlane, John, 151 North St., Glasgow
 1879 McFarlane, R., 1 Great Western Terrace, Glasgow
 1875 MacGregor, G. Sheriff, 5 Huntly Gardens, Glasgow
 1872 McIlwraith, Jas., 92 Regent St., Glasgow
 1859 McKean, Robert, Lunloch, Bishopbriggs
 1853 Mackenzie, J. M., Garrison Tower, Wishaw
 1864 Mackie, J. L., Ravelston, Great Western Road, Glasgow
 1874 Mackirdy, General Elliot, of Birkwood, Lesmahagow
 1876 Macleac, A. Crum, of Cathkin, 149 St Vincent Street, Glasgow
 1854 Maclean, Hector Frederick, Carnwath
 1883 MacLellan, Robert, Conservative Club, Glasgow
 1888 McLennan, Bailie James, 40 St Andrew Street, Glasgow
 1882 McNeill, A., 46 Gordon Street, Glasgow
 1875 McPherson, D., 95 Finlay Drive, Dennistoun, Glasgow
 1856 Macpherson, J., Blantyre Farm, Glasgow
 1882 McQueen, David, Factor, Wishaw
 1884 McQueen, Hope, Midlock, Abington
 1884 McWilliam, Andrew, 88 Queen Street, Glasgow
 1874 Main, Jas. A. R. (A. & J. Main & Co.), Gordon Street, Glasgow
 1879 Main, R. R. (A. & J. Main & Co.), Possil Park, Glasgow
 1889 Marshall, James, Airbles, Motherwell
 1880 Marshall, John, Sandyford, Holytown

Admitted

- 1877 Martin, E., 11 Kew Terrace, Kelvinside, Glasgow
 1858 Martin, John, Hamilton
 1870 Merricks, William, 166 Buchanan St., Glasgow
 1888 Millar, James, Eikdon Villa, Mount Florida, Glasgow
 1884 Millar, John, 16 St Vincent Place, Glasgow
 1868 Miller, G. J., of Frankfield, Shettleston
 1885 Mitchell, James, Auchengray House, Airdrie
 1888 Mitchell, Robt., M.R.C.V.S., 18 Shaftesbury Street, Glasgow
 1889 Mitchell, William, Hazleside, Douglas
 1861 Moffat, George, Clyde View, Partick
 1875 Morton, J., Nether Abington, Abington
 1859 Mosman, H., of Auchtyfardle, Lesmahagow
 1874 Muirhead, William, Winton Place, Uddingston
 1875 Murdoch, Alexander, Gartcraig, Shettleston
 1888 Murdoch, James, jun., Gartcraig, Shettleston
 1874 Murdoch, J. F., East Hallside, Newton
 1875 Murdoch, John, Carnlyne, Shettleston
 1857 Murdoch, Robert, Hallside, Cambuslang
 1862 Murray, John L., of Heayside, Biggar
 1884 Murray, John, Parkhall, Douglas
 1874 Murray, Robert G., of Spital, Biggar
 1875 Napier, John S., of Lethame, Strathaven
 1867 Neilson, William, Bank of Scotland, Bellshill
 1887 Nimmo, Thomas, Lawhead, Forth
 1887 Orr, Wm., 45 West Nile Street, Glasgow
 1881 Park, James, Dechnont, Cambuslang
 1877 Paterson, G. R., Drumlalbin, Thankerton
 1884 Paterson, James, jun., Over Abington, Abington
 1860 Paterson, James, of Carnacoup, Douglas
 1862 Paterson, John, Nether Howcleugh, Moffat
 1887 Paterson, John, of Torfoot, Strathaven
 1848 Paterson, Robert, of Birthwood, Biggar
 1884 Paterson, Wm., Grange, Thankerton
 1885 Paton, James, Glencaple, Abington
 1854 Pearson, Andrew A., of Springfield, Carlisle
 1869 Pender, J., Springhill, Stane, Shotts
 1889 Pollock, James, V.S., Hamilton
 1884 Pollock, W., Yorker Mains, Glasgow
 1884 Pringle, John, Castle Mains, Douglas
 1890 Ramsay, Professor G. G., University, Glasgow
 1882 Rattray, Patrick, C.A., 88 St Vincent St., Glasgow
 1867 Reid, F. R., of Gallowflat, Rutherglen
 1885 Reid, William, 140 St Vincent Street, Glasgow
 1882 Rennie, David, 72 M'Alpine Street, Glasgow
 1867 Ritchie, John, Whitecastle, Biggar
 1882 Robb, Geo., 11 Germiston Street, Glasgow
 1882 Rodger, Hugh, Estates Office, Airdrie
 1884 Ross, John M., 2 Devonshire Gardens, Kelvinside, Glasgow
 1877 Russell, George, Carnwath
 1875 Russell, James, National Bank, Airdrie
 1882 Russell, James, Allanton, Hamilton
 1871 Salmon, David S., 40 St Enoch Square, Glasgow
 1875 Sanderson, James, West Yard Houses, Carnwath
 1884 Sandilands, R., South Cumberhead, Lesmahagow
 1868 Scott, James, Bogton, Bishopbriggs
 1878 Scott, Jas., Distiller, Garrison Tower, Wishaw

Admitted

- 1868 Scott, J., Springfield House, Uddingston
 1886 Scott, J., 43 Westbourne Gardens, Kelvinside, Glasgow
 1885 Scott, John, of Auchinloch, Lenzie
 1868 Scott, M., Bogton, Bishopbriggs
 1875 Scott, William, Carnbooth, Carmunnock
 1882 Shirlaw, James, Carfin, Motherwell
 1889 Shirlaw, John, Howgate, Carlisle
 1877 Shead, George, Royal Bank, Wishaw
 1880 Smellie, James, Coursington, Motherwell
 1852 Smith, Alex., Westbourne, Govan
 1856 Smith, Andrew, Milnwood, Lanark
 1876 Smith, C., 36 Howard Street, Glasgow
 1857 Smith, H., 9 Kelvinside Terrace (North), Glasgow
 1867 Somerville, G. P., Muirhouse, Carnwath
 1886 Speir, John, Newton Farm, Newton, Glasgow
 1838 Speirs, Thomas D., Western Club, Glasgow
 1875 Spencer, A., 160 Hope Street, Glasgow
 1888 Sprot, Major A., of Carnkirk, Chryston, Glasgow
 1883 Stalker, Donald, Mossend Farm, Mossend, Glasgow
 1861 Stark, W., 133 Watt Street, Glasgow
 1880 Steel, John, Lochwood, Gartcosh
 1872 Stevenson, Wm., Lochgrog, Bishopbriggs
 1869 Stewart, D. W., Cartland, Lanark
 1854 Stewart, John, Cattle Market, Glasgow
 1881 Stewart, R. K., of Murdostoun, Newmans
 1855 Stodart, David, Banker, Lanark
 1889 Stuart, Col. Harrington, of Torrance, East Kilbride
 1881 Tervit, John, Boat, Thankerton
 1889 Thomson, A. J., Huntfield, Biggar
 1869 Thomson, John, 41 Mitchell Street, Glasgow
 1882 Thomson, Seton (Rose, Murison, & Thomson), St Vincent Place, Glasgow
 1888 Thomson, S. M., Merchant, Lanark
 1884 Thomson, Wm., Smith Street, Kinning Park, Glasgow
 1875 Thomson, W. G., 41 Mitchell Street, Glasgow
 1877 Thorburn, Robert, Stonehill, Thankerton
 1857 Turnbull, Gregor, Merchant, Glasgow
 1882 Ure, John, 66 Washington Street, Glasgow
 1882 Vere, J. C. Hope, of Blackwood, Lesmahagow
 1874 Waddell, J., Airdriehill, New Monkland
 1882 Wallace, Hugh, 30 Havelock Street, Glasgow
 1888 Wallace, John, 273 Argyle Street, Glasgow
 1882 Wallace, John, The Ingle, Rutherglen
 1879 Wallace, W. (John Wallace & Sons), Graham Square, Glasgow
 1852 Warnock, A., Bearyards, Bishopbriggs
 1882 Watson, Adam, Ochs Castle, Newbigging
 1888 Watson, G. M., Butlaws, Lanington
 1883 Watson, John, 205 West George Street, Glasgow
 1857 Watson, John, of Earnock, Hamilton
 1884 Watson, Robert, Culterallers, Biggar
 1880 Watt, John, Drumgray, Airdrie
 1875 Watt, Robert, Solicitor, Airdrie
 1877 Weir, James, Sandilands, Lanark
 1884 Weir, W. C., 10 Princes Terrace, Glasgow
 1878 Williams, Robert, The Green, Wishaw
 1884 Williamson, Alex., Chesterhall, Wiston, Biggar
 1878 Williamson, James, Greenhead, Wishaw
 1883 Wilson, Andrew, Dalzell, Motherwell
 1888 Wilson, James, Westburn, Cambuslang
 1889 Wilson, John, West Netherton, East Kilbride

Admitted

- 1879 Wilson, W., Water Meetings, Abington
 1877 Wingate, Andrew, Castlehill, Wishaw
 1889 Wood, Alex., 8 & 10 Stockwell Street, Glasgow
 1877 Wragg, Charles, 4 Stockwell Street, Glasgow
 1873 Young, Wm., Waterbank, Carmunnock
 1870 Yuill, Archibald, Netherside, Strathaven

RENFREW.

- 1887 Alexander, P. D., Bridge of Weir
 1884 Allan, David, M.R.C.V.S., Clarkston, Busby
 1888 Anderson, A. D., Newbank, Giffnock
 1880 Bartlemore, William, Solicitor, Paisley
 1886 Blair, James, Bankfoot, Inverkip
 1843† BLANTYRE, Lord, Erskine, Glasgow
 1884 Bryce, David, Abbots Inch, Paisley
 1865 Burns, Sir John, of Castle Wemyss, Bart., Wemyss Bay
 1888 Calderwood, John, Bogside, Eaglesham
 1878 Caldwell, Hugh, of Braes, Kilbarchan
 1857 CAMPBELL, Lieut.-Col. Sir A. C., of Blythswood, Bart., M.P., Renfrew
 1884 Clark, James, Burnside, Mearns
 1884 Clark, Wm., Netherlea Farm, Cathcart
 1888 Coats, Thos. Glen, of Ferguslie Park, Paisley
 1882 COCHRANE, The Hon. Thomas, Dankeith, Kilmarnock
 1850 Colquhoun, J., Corkerhill, Pollockshaws
 1884 Crawford, John W., Greenock
 1878 Cross, Alex., jun., Eastbank, Langbank
 1881 Cross, David, Eastbank House, Langbank
 1865 Cruni, Alex., of Thornliebank, Glasgow
 1880 Cunningham, J. C., of Craigends, Johnstone
 1882 Ferguson, A. R., Writer, Neilston
 1875 Ferguson, Peter, Rock Cottage, Renfrew
 1883 Fleming, Wm., Fulwood Mains, Linwood
 1857 Gilmour, Matt., Town of Inchinnan, Paisley
 1857 Glegg, J., Factor, Milliken House, Johnstone
 1838 Gordon, John, of Aitkenhead, Cathcart
 1871 Gray, John, Newlandsfield, Glasgow
 1877 Herron, W., Town-Clerk, Renfrew
 1875 Holm, John, Jaapston, Neilston
 1875 Houston, Geo. L., of Johnstone, Johnstone
 1879 Howie, William, Finnochbog, Inverkip
 1857 Hunter, Jas., Braehead House, Cathcart

Admitted

- 1884 Jackson, Jas., Carolside, Busby
 1875 Jamieson, Wm., Tighnamara, Wemyss Bay
 1889 King, Robert A., Fulwood, Linwood
 1875 Lang, Alex., Garneyland, Paisley
 1882 Locke, Matthew, Arthurlie, Barrhead
 1874 Lothian, M. J., Glenlora, Lochwinnoch
 1875 Love, Alex., Margaret's Mill, Kilmalcolm
 1875 Macdowell, H., of Garthland, Lochwinnoch
 1884 M'Kie, H. B., Freeland, Erskine
 1875 M'Lachlan, Colin, Drums, Greenock
 1873 MacPhedran, J. M., of Craighet, Bridge of Weir
 1885 Mactavish, D. A., Solicitor, Johnstone
 1873 Mather, Wm., Kirkhill, Newton Mearns
 1884 M'William, John, Fairfield, Paisley
 1889 MAXWELL, Sir John Maxwell Stirling, of Pollok, Bart., Renfrew
 1864 Myles, James, Deanside, Renfrew
 1890 Orr, Robert Risk, Lochwinnoch
 1881 Park, Walter, Hatton, Bishopton, Erskine
 1853 Paterson, Jas., 32 Eldon Street, Greenock
 1867 Peile, H. R. B., Manson House, Greenock
 1882 Pollock, John, Greenlaw, Mearns
 1873 Pollok, John, of Blackhouse, Mearns
 1883 Pottie, Alexander, V.S., Paisley
 1888 Purdon, Matthew, Drumby Farm, Busby
 1875 Ramsay, John, Butcher, Kilbarchan
 1859 Ranne, M. G., Heathbank Villa, Hunters Quay, Greenock
 1888 Reid, Colin, Castle Farm, Mearns
 1882 Reid, Robert, Writer, Lochwinnoch
 1888 Reid, William, Titwood Farm, Mearns
 1863 Richardson, David, of Hartfield, Greenock
 1874 Richardson, George, Linwood, Paisley
 1863 Riddell, David, Blackhall, Paisley
 1882 Robinson, Archd., M.R.C.V.S., Greenock
 1880 Scott, A., 24 Mearns Street, Greenock
 1882 Scott, James B., Ryeraes, Linwood
 1875 Scott, Robt. Sinclair, Craigievar, Wemyss Bay
 1853 Steele, Robert, Greenock
 1848† STEWART, Sir M. R. Shaw, of Greenock and Blackhall, Bart., Ardgowan, Greenock
 1875 Stodart, G., Netheraton, Newton Mearns
 1880 Taylor, William, Park Mains, Inchinnan
 1888 Wallace, John, Broadlee, Neilston
 1871 Wilson, James, Boghall, Houston
 1883 Wilson, John, Erskine, Bishopton
 1863 Wilson, Robert, Manswrae, Kilbarchan
 1888 Young, Alex., Castlehill Farm, Eaglesham
 1883 Young, R. C., Netherfield, Paisley

2.—PERTH DISTRICT.

EMBRACING THE

COUNTIES OF FIFE, FORFAR (WESTERN DIVISION), KINROSS,
AND PERTH (EASTERN DIVISION).

FIFE.

- | | |
|---|---|
| Admitted | Admitted |
| 1861 Aitken, George, Tyrie, Kirkealdy | 1887 Bowman, George M., of Logie, Cupar-Fife |
| 1883 Aitken, George Lewis, Boghilly, Kirkealdy | 1859 Bowman, James, Newark, St Monance |
| 1888 Allan, James, Dysart | 1890 Braid, John, Abercrombie, St Monance |
| 1875 Anderson, Charles, Fettykil, Leslie | 1885 Briggs, Major-General, of Strathairly, Largo |
| 1877 Anderson, David, Cassendilly, Cupar-Fife | 1891 Brown, Andrew, Rossie, Collessie |
| 1867 Anderson, W. H., Anchor Lodge, Anstruther | 1876 Brown, John, of Colton, Dunfermline |
| 1878 Andrews, John, Melville, Collessie | 1875 Bruce, Hon. R. P., Broomhall, Dunfermline |
| 1862 Arnot, David, Priarton, Newport, Fife | 1842 Bruce, John, W.S., 8 South Bell Street, St Andrews |
| 1886 Arnot, Thomas, Newton of Falkland, Falkland | 1855 Bruce, T., of Arnot, Arnot Tower Leslie |
| 1884 Auchterlonie, Alex., Hayston, Leuchars | 1884 Buchan, Thomas, Balhousie, Largo |
| 1884 Auchterlonie, James, Dothan, Kirkealdy | 1890 Burton, George W., Shiels, Collessie |
| 1844 Aytoun, R. S., of Inchdairnie, Kirkealdy | 1889 Buttercase, Andrew, Uthrogie, Cupar-Fife |
| 1873 Baird, William, of Elie, Fife | 1865 Campbell, Lieut.-Col. A. H., Cunnockhie, Cupar-Fife |
| 1884 Balfour, Edward, yr. of Balbirnie, Markinch | 1880 Carnegie, James, of Aytoun Hill, Newburgh |
| 1857 Balfour, Major F. W., of Fernie Castle, Cupar-Fife | 1869 Carswell, David, of Rathillet, Cupar-Fife |
| 1890 Balfour, Francis, yr. of Fernie, Fernie Castle, Cupar-Fife | 1885 Carswell, J. H., Straiton, Leuchars |
| 1839 Balfour, John, of Balbirnie, Markinch | 1868 Cartwright, T. R. B. Leslie Melville, Melville House, Ladybank |
| 1871 Ballingal, Neil, Sweetbank, Markinch | 1886 Cathcart, James T., yr. of Pitcairlie, Auchtermuchty |
| 1861 Ballingall, John, Dunbog, Newburgh | 1857 Cathcart, R., of Pitcairlie, Auchtermuchty |
| 1890 Banks, James, Pittieddie, Kinghorn | 1883 Cheape, Captain G. C., of Wellfield, Strathmiglo |
| 1859 Barclay, Robert, Drums, Falkland | 1889 Cheape, Mrs., of Wellfield, Strathmiglo |
| 1886 Baxter, Edward Gorrel, of Teasses, Largo | 1881 Cheape, J., yr. of Lathockar, St Andrews |
| 1856 Bell, David, Todhall, Cupar-Fife | 1879 Christie, F. W., Dairsie Mains, Cupar-Fife |
| 1879 Bell, Dr James M., Kettle | 1890 Christie, James M., Scotsraig, Newport |
| 1880 Bell, John, Stenton, St Monance | 1874 Christie, John, Kirktonbarns, Tayport |
| 1890 Bell, Thomas, Todhall, Cupar-Fife | 1861 Christie, P., Mains of Scotsraig, Tayport |
| 1865 Bell, T., Craigkennochy Terrace, Burntisland | 1889 Clark, Alex., Balmullo, Leuchars |
| 1877 Bennet, Arthur, South Pitkinnie, Lochgelly | 1870 Cleghorn, Dr., of Stravithy, St Andrews |
| 1861 Berwick, David, Ardross, Elie | 1890 Constable, John, M.D., Leuchars |
| 1833 Bethune, Colonel R., of Nydie, St Andrews | 1890 Craig, James, Urquhart, Dunfermline |
| 1859 Beveridge, David, Dunfermline | 1878 Craig, John, Craigcalf, Kinghorn |
| 1862 Beveridge, George, Kirkealdy | 1866 Crawford, R., Balbougie, Inverkeithing |
| 1869 Beveridge, Jas., Crombie, Dunfermline | 1879 Cunningham, David, Dalachy, Burntisland |
| 1872 Beveridge, William, of Bonnyton, Dunfermline | 1879 Cunningham, John, Burntisland |
| 1862 Beveridge, William, 248 High Street, Kirkealdy | 1883 Cunningham, T. D., The Mount, Cupar |
| 1881 Beveridge, William, jun., Eastgrange, Dunfermline | 1880 Curr, James, St Fort, Newport, Fife |
| 1879 Bisset, Alex., Balfarg, Markinch | 1881 Curror, Peter, Maltstree, Kirkealdy |
| 1883 Black, James, Tullybreck, Markinch | 1880 Davidson, George P., Kirkbank, Burntisland |
| 1890 Black, John, Nether Pratis, Leven | 1851 Dingwall, William, Ramornie, Ladybank |
| 1889 Blyth, James, jun., Logie, Cupar-Fife | 1873 Drummond, J., jun., Blacklaw, Dunfermline |
| 1890 Blyth, William, Auchtermuchty | |
| 1879 Bonthrone, A., Newton of Falkland, Falkland | |
| 1858 Borthwick, W. H., Barham, Cupar-Fife | |

Admitted

- 1860 Dryburgh, J., Kininmonth, Cupar-Fife
 1861 Drysdale, Wm., of Kirrie, Kinghorn
 1884 Dun, George, Easter Kincaple, St Andrews
 1890 Duncan, Mrs Morison, of Naughton, Newport
 1888 Duncan, Miss C. H. A. Morison, of Naughton, Newport
 1857 Duncan, Alex., Craigfoodie, Cupar-Fife
 1883 Duncan, John, Kirkmay, Crail
 1871 Duncan, John, yr. of Kinkell, St Andrews
 1882 Duncan, John W., Boghall, Kingsbarns
 1855 Duncan, Robert, of Kirkmay, Crail
 1885 Duncan, Thomas L., Pusk, Leuchars
 1881 Elder, Hugh, Dunfermline
 1875† ELGIN and KINCARDINE, the Earl of, Broomhall, Dunfermline
 1867 ELPHINSTONE, Hon. Edward B. C. B., Comrie Castle, Dunfermline
 1860 ESKINE, Sir Thomas, of Cambo, Bart., Crail
 1890 Fairbairn, W. D., M.R.C.V.S., Cupar-Fife
 1891 Fairlie, J. O. R., of Myres Castle, Auchtermuchty
 1890 Farmer, A. Douglas, Kinkell, St Andrews
 1884 Farmer, A. F., of Brownhills, St Andrews
 1884 Farmer, Robert, of Kingask, St Andrews
 1882 Ferguson, R. C. Munro, of Raith, M.P., Kirkcaldy
 1891 Ferrie, David, Parbroath, Cupar-Fife
 1859 Finlay, John, Lochend, Lochgelly
 1861 Flockhart, J., Banker, Colinsburgh
 1873 Forgan, James, Sunnysbraes, Largo
 1857 Fortune, George, Barnmuir, Crail
 1871 Foulis, Dr R., of Cairney Lodge, Cupar-Fife
 1861 Fyfe, Robert, Hillhead, Dunduff, Dunfermline
 1879 Fyshe, Jas., jun., Treaton, Markinch
 1888 Galloway, John, Milton, Leuchars
 1871 Gibb, David, Balmouth, Pittenweem
 1877 Gibson, James, Aithernie, Leven
 1877 Gilchrist, Andrew, Carvenom, Anstruther
 1871 Gillespie, Alex., Balmcadouside, Cupar-Fife
 1841 Gillespie, D., of Mountquhannie, Cupar-Fife
 1872 Gilmore, John, of Montrave, Leven
 1887 Goodall, Thos., Cardenburns, Cardendean
 1888 Gourlay, J. Murray, 1 Hope St., St Andrews
 1887 Grace, Stuart, St Andrews
 1885 Gray, T. M., Barony Cottage, Cupar-Fife
 1869 Haig, H. V., Ramornie, Ladybank
 1881 Hamilton, Jas. A., West Muircambus, Kilconquhar
 1871 Hoggie, R. B., West End House, Kirkcaldy
 1891 Henderson, A. L., Kingsdale, Kenno-way
 1884 Hepburn, James, Forth Bank, Kinghorn
 1877 Hepburn, John, Kinghorn
 1876 Herdman, B. A., Falkland Wood, Falkland
 1872 Hill, David, Upper Magus, St Andrews
 1881 Hill, John, Langside, Kennoway
 1884 Husband, D., Struthers, Cupar-Fife
 1883 Hutchison, Alex., Ingleside, Kirkcaldy
 1891 Hutton, John, West Newhall, Crail
 1887 Inglis, John, Colluthie, Cupar-Fife
 1887 Inglis, R. T., Blinkbonny Lodge, Newburgh
 1879 Ireland, David S., of Denork, St Andrews

Admitted

- 1889 Irvine, Walter, of Grangemuir, Pittenweem
 1876 Jamieson, W. T., Solicitor, Anstruther
 1890 Johnston, John, New Inn, St Andrews
 1882 Johnston, S. W., Fincaikes, Newport
 1874 Johnstone, W. M., Banker, Cupar-Fife
 1890 Kay, Alex., Flax, Newport
 1885 Kldd, A. F., High St., West Aberdeen
 1859 Kininmonth, Peter, Collairnie, Newburgh, Fife
 1884 Kinnear, John Boyd, of Kinloch, Ladybank
 1879 Knight, Robert, jun., V.S., Dunfermline
 1877 Landale, Jas., Woodmill, Auchtermuchty
 1874 Landale, John, of Woodbank, Dunfermline
 1859 Lauder, Dewar, South St., St Andrews
 1873 Lawrie, John, Kirklandhill, Leven
 1853 Lawson, Alex., of Burnturk, Kettle
 1890 Lawson, Henry Graham, Causewayhead, Newport
 1867 Lawson, Thos., of Carriston, Markinch
 1863 Lee, John, East Coates, Largo
 1884 Lees, David, Pitscottie, Cupar
 1862 LESLIE, Hon. G. Waldegrave, Leslie House, Leslie
 1885 LINDSAY, The Earl of, Kilconquhar House
 1889 Lochead, Matthew, Wester Balgarvie, Cupar-Fife
 1889 Macaulay, James F., Lochgelly Mains, Lochgelly
 1854 Macdonald, Alex., of Edenwood, Cupar-Fife
 1869 M'Farlane, James, Writer, Dunfermline
 1890 M'Gibbon, John, Bankhead, Leven
 1890 M'Gregor, Donald, Broomhall Estate Office, Charlestown
 1890 M'Gregor, James Fleming, Greenside, Largo
 1878 M'Intosh, Dr, University, St Andrews
 1871 Macland, Henry, Balmungo, St Andrews
 1879 Marshall, Walter, of Lochmaloney, Cupar
 1879 Martin, James, Priestfield, Pittlessie, Ladybank
 1871 Matheson, Kenneth, Dunfermline
 1880 Meldrum, D. B., of Kincaple, St Andrews
 1859 Meldrum, J., of Eden Bank, Pittormie, Cupar-Fife
 1869 Melville, J. M. Balfour, Mount Melville, St Andrews
 1875 Menzies, Fergus, Blackhall, Dunfermline
 1877 Millar, J., of Waulkmill, Dunfermline
 1890 Miller, James Gilbert, Starr, Cupar-Fife
 1870 Millie, George, St Mary's, Cupar-Fife
 1883 Mitchell, Alex., Finmonth, Kinglassie
 1861 Mitchell, John, Fliskmilm, Cupar-Fife
 1872 Mitchell, John, Newbugging, Burntisland
 1859 Mitchell, Robert, 3 Bonnygate, Cupar-Fife
 1878 Morrison, B. G. W., of Falfield, Cupar-Fife
 1890 Morton, David, Craighead, Crail
 1879 Muckersie, Henry, Drumsin, Dunfermline
 1890 Mudie, T. E., Greenside, Largo
 1875 Muirhead, T., Townhill Store, Dunfermline
 1853 Munro, John, of Kinloss, Cupar-Fife
 1883 Nairn, M. B., of Rankellour, Cupar
 1884 Nisbet, T. M., Forthar, Kettle
 1880 Normand, William J., Dysart
 1873 Oliphant, T. T., Queen Mary's, St Andrews
 1882 Osborne, David, Banker, Cupar-Fife
 1848 Oswald, J. T., of Dunnikier, Kirkcaldy
 1886 Page, Walter, Bogleys, Kirkcaldy
 1859 Paton, John, Kirkness, Lochgelly

Admitted

- 1873 Pitblado, C. B., Mavisbank, Oakley, Dunfermline
 1884 Pitcairn, D. D., Kinnaird of Newburgh
 1863 Pitcairn, John, 9 Abbotsford Crescent, St Andrews
 1864 Prentice, G., of Strathore, Thornton
 1865 Prentice, R. R., Cameron Bridge House, Windygates
 1889 Purvis, Capt. A. B., R.A., Kinaldy, St Andrews
 1844 Purvis, John, of Kinaldy, St Andrews
 1864 Reekie, A., Walton, Auchtertool, Kirkcaldy
 1886 Reid, Andrew, V.S., Auchtermuchty
 1882 Reid, John, of Dunduff, Dunfermline
 1878 Rigg, James Home, of Tarvit, Cupar-Fife
 1861 Rintoul, D., Mains of Blebo, Cupar-Fife
 1873 Roberts, J., Greenhead of Arnot, Leslie
 1882 Robertson, Donald, of Mayfield, Cupar-Fife
 1859 Robertson, J., Denbrae, Cupar-Fife
 1891 Ross, Nicol, Cattle-salesman, Dunfermline
 1859 Russell, David, Silverburn, Leven
 1882 Russell, George, Hatton, Largo
 1869 Russell, James, of Kinsaleth, Cupar-Fife
 1890 Russell, Robert, Luthrie, Cupar-Fife
 1883 Scott, James Addison, 3 Kinburn Terrace, St Andrews
 1881 Scott, John, Hillhead, St Andrews
 1883 Sheppard, Thomas, Moonzie, Cupar
 1879 Sime, Alex., Dunbarrie, Largo
 1880 Simpson, John, Burntisland
 1857 Small, L., of Foodie, Cupar
 1882 Smith, James T., Duloch, Inverkeithing
 1890 Smith, John H., Kingskettle
 1886 Smith, Thomas, Inverdavot, Newport
 1865 Spears, W. R., Writer, Kirkcaldy
 1870 Stark, Robert, Kirkcaldy
 1876 Stenhouse, J. S., of Northfod, Dunfermline
 1882 Stevenson, John, Lillyhill House, Dunfermline
 1890 Storrar, David, Land Surveyor, Cupar-Fife
 1889 Syme, John, Nether Strathkinness, St Andrews
 1857 Syme, William, Craigie, Leuchars
 1871 Thom, James, of Leden Urquhart, Gate-side
 1875 Thom, James F., Wellsgreen, Windygates
 1891 Thom, James, Gibliston, Colinsburgh
 1879 Thom, R. D., Pitlochrie, Strathmiglo
 1891 Thomson, Henry, Perceval, Buckhaven
 1848 Thomson, Colonel John A., of Charleton, Colinsburgh
 1877 Tod, James, Easter Cash, Strathmiglo
 1875 Troup, Alexander, Strathmiglo
 1873 Tulloch, James, Dales, Inverkeithing
 1867 Veitch, Walter, Grange, Kinghorn
 1878 Walker, Archibald, Banker, Auchtermuchty
 1890 Walker, Peter C., Kilmaron, Cupar-Fife
 1875 Walker, Thos., Denperston, Auchtermuchty
 1859 Walker, W., South Quarter, Kingsbarns
 1882 Wallace, George, Banker, Cupar-Fife
 1861 Wallace, James, Brake, St Andrews
 1891 Wallace, John, Duniface, Leven
 1882 Wallace, R. H., Newton Hall, Windygates
 1880 Wallace, T. A., Banker, Burntisland
 1875 Wallace, William, Kinnear, Leuchars
 1883 Walls, Robert, Grange, Burntisland
 1873 Watt, Alex., Balbarton, Kirkcaldy
 1871 Watt, George, Kilnany, Cupar-Fife
 1882 Watt, W., Seed Merchant, Cupar-Fife
 1890 Webster, Thomas, Nisbetfield, Ladybank
 1874 Wedderburn, H. S., of Wedderburn, Birkhill, Cupar

Admitted

- 1884 Weighton, J. G., of Priorletham, St Andrews
 1889 Wemyss, Alexr. Watson, Denbrae, St Andrews
 1880 Wemyss, D. W., 9 North Bell Street, St Andrews
 1872 Wemyss, R. G. E., of Wemyss, Kirkcaldy
 1875 Whyte, John, Lundin Mill, Largo
 1857 Wilkie, George, Cowdenlaws, Dysart
 1882 Wilson, Geo., Gladstone Cottage, Cupar
 1880 Wilson, P., Seed-crusher, Burntisland
 1882 Wilson, Robt M., Brucefield, Dunfermline
 1877 Wood, Major William, Falkland
 1859 Young, A., Lochtyside, Thornton, Kirkcaldy
 1875 Younger, J. B. B. C., North Callange, Cupar

FORFAR

(WESTERN DIVISION).

- 1881 Adams, Dr James, Oathlaw, Forfar
 1882 Airlie, The Earl of, Cortachy Castle
 1881 Alexander, John, Ballindarg, Kirriemuir
 1890 Andrew, James M., Magdalenec, Kirkton, Dundee
 1853 Arklay, John, Seafield, Broughty Ferry
 1868 Arklay, Robert, of Ethiebeaton, Dundee
 1871 Arnot, Wm., Glamis Mains, Glamis
 1886 Ballingal, Hugh, Ardarroch, Dundee
 1889 Batchelor, Francis M., Craigo, Dundee
 1890 Baxter, George Washington, Ashcliff, Dundee
 1879 Bell, Alexander, Kirkton of Tealing, Dundee
 1871 Bell, G., Barns of Claverhouse, Dundee
 1856 Bell, Thomas, Ballushoe, Kirriemuir
 1890 Bell, Thomas, of Belmont, Dundee
 1890 Bell, William Forsyth, Barns of Claverhouse, Dundee
 1890 Berry, James, Merchant, Dundee
 1884 Bett, Thos., Pitermo, Dundee
 1890 Birrell, Andrew, Simprim, Meigle
 1876 Black, John, Cortachy, Kirriemuir
 1884 Braid, Thos., Assistant Factor, Newtyle
 1879 Bruce, Andrew, Jordanston, Meigle
 1867 Burr, Rev. P. Lorimer, Lundie Manse, Dundee
 1861 Buttar, David, Corston, Coupar-Angus
 1882 Buttar, Thomas A., Corston, Coupar-Angus—*Free Life Member*
 1881 Cameron, James, Murthill Farina Works, Forfar
 1871 Camperdown, The Earl of, Camperdown, Dundee
 1890 Carmichael, James, Mayfield, Dundee
 1858 Carnegie, W., yr. of Dunlappie, Coull, Forfar
 1861 Carver, John, Kinloch, Meigle
 1884 Clark, James, F.R.C.V.S., Abbeyhill, Coupar-Angus
 1881 Cowpar, James, Over Migvie, Kirriemuir
 1890 Cox, Alfred W., Beechwood, Lechee
 1890 Cox, Edward, of Cardan, Meigle
 1882 Cox, Geo. M., Beechwood, Dundee
 1890 Dewar, James C., Airlie Arms Hotel, Kirriemuir
 1881 Duke, Wm., Newbarns, Kirriemuir
 1883 Duncan, John, Braehead, Kirriemuir
 1879 Duncan, Patrick G., East Menus, Kirriemuir
 1887 Duncan, Wm., Welltown, Meigle
 1881 Duncan, W. G., Balkemback, Tealing, Dundee
 1887 Farquharson, Alex., Greenburn, Coupar-Angus
 1889 Farquharson, A. J. Newtyle—*Free Life Member*

Admitted

1879 Ferguson, Jas., Balunie, Coupar-Angus
 1843 Forrest, James, jun., Kirriemuir
 1879 Fullarton, James, Balgove, Coupar-Angus
 1890 Gardiner, Thomas J., Banchory, Coupar-Angus
 1886 Gellatly, Wm., Seed-crusher, Dundee
 1890 Gilroy, George Alexander, Broughtly Ferry
 1890 Gourlay, Henry, Balgay House, Dundee
 1879 Graham, D. M., Auctioneer, Forfar
 1890 Grainger, John, Pitcur, Coupar-Angus
 1890 Grant, Alex., Forfar
 1890 Grant, John, Craig Mills, Dundee
 1881 Guild, Thomas, Herdhill, Kirriemuir
 1890 Halkett, John Gilbert Hay, Balendoch, Meikle
 1870 Hanning, J. J., 31 Tait's Lane, Dundee
 1871 Harris, Wm., Innkeeper, Alyth
 1878 Henderson, G. D. C., Com. R.N., of Invergourie, Dundee
 1890 Henderson, William, Milton of Collace, Coupar-Angus
 1889 Hendry, William, Mains of Coull, Kirriemuir
 1861 Hill, James, Braidestone, Meikle
 1888 Hunter, Wm., 15, 17, 19 Wellgate, Dundee
 1882 Hutcheson, And., 10 Dudhope Place, Dundee
 1890 Jack, Henry, Menzies Hill, Dundee
 1890 Johnston, Alex., Castle of Mains, Dundee
 1890 Johnston, John, 14 St Clement's Lane, Dundee
 1890 Keiller, John Mitchell, of Morven, Binnrock, Dundee
 1890 Kidd, David, Ardilar, Coupar-Angus
 1829 Kinloch, Col. John Grant, of Kilrie, Logie, Kirriemuir
 1888 Kyd, Robert, Implement-maker, Coupar-Angus
 1871 Lowson, Wm., Gray Bank, Dundee
 1890 Lyburn, John, Kinochtry, Coupar-Angus
 1870 M'Farlane, William, 177 Blackness Road, 8 Ferguson's Buildings, Dundee
 1865 M'Gavin, Robert, of Ballumnie, Dundee
 1890 MacIntyre, Peter, Dentind, Monikie, Dundee
 1891 Macintosh, Wm., factor, Idvies, Forfar
 1890 M'Kay, Alexander, Mains of Auchterhouse, Dundee
 1890 Marshall, James Scott, Wynton Chemical Works, Dundee
 1891 Martin, Robert, Baldovie, Kirriemuir
 1890 Mathers, David, Hotel-keeper, Dundee
 1885 Menzies, W. D. Graham, Hallyburton, Coupar-Angus
 1843 Miller, O. G., of Pittendreech, Dundee
 1890 Murray, J. Douglas, Viewbank, Meikle
 1887 Myles, Rob., Colamoy, Cortachy, Kirriemuir
 1867 Nicol, T. Monro, Littleton, Kirriemuir
 1891 Nicoll, William, Carsebank, Forfar
 1859 Ogilvy, John, Harecraig, Dundee
 1871 Ogilvy, Sir Reginald H. A., of Inverquharie, Bart., Baldovan House, Dundee
 1890 Pattullo, David, South Gask, Coupar-Angus
 1885 Pattullo, William, 19 St Andrew Street, Dundee
 1849 Powrie, James, of Reswallie, Forfar
 1880 Primerose, A. G., Dock Street, Dundee
 1868 Ralston, Andrew, Glamis House, Glamis
 1876 Reid, George, Ladywell, Kirriemuir
 1873 Reid, James, Kilmundy, Glamis
 1879 Ritchie, R. B., Accountant, Dundee
 1890 Robertson, Alexander, of Burnside, Forfar

Admitted

1890 Robertson, Wm. Brown, Dudhope House, Dundee
 1862 Rogers, James S., Rose Mill, Dundee
 1881 Rogers, Wm., Ph.D., Rose Mill, Dundee
 881 Ross, Wm., North Drumgilly, Forfar
 1890 Scott, George C., The Retreat, Dundee
 1882 Scott, Robert, 56 Dundee Road, Forfar
 1888 Sharp, Andrew, 18 Constitution Street, Dundee
 1890 Sharp, John, jun., Balmuir House, Dundee
 1890 Shiell, John, Solicitor, Bank Street, Dundee
 1890 Short, James, Royal Hotel Stables, Dundee
 1890 Sidey, James, Hatfield, Coupar-Angus
 1887 Small, W. J., Dundee
 1889 Smart, John B., Pitairlie, Monifieth, Dundee
 1877 Smith, Thomas, Powrie, Dundee
 1884 Smith, Thomas, Mains of Fowls, Dundee
 1884 Smith, William, Ward Road, Dundee
 1890 Spreull, Andrew, V.S., Yeaman Shore, Dundee
 1891 Strachan, Robert, West Pilmor, Longforgan, Dundee
 1867*†STRATHMORE, The Earl of, Glamis Castle
 1890 Tasker, George, Arnbog, Meikle
 1889 Tasker, William, Camno, Meikle
 1890 Thoms, Thomas S., Benvie, Invergourie, Dundee
 1881 Toplis, Robert, Glamis Hotel, Glamis
 1881 Turnbull, George, Balnoulkie, Tanalade
 1880 Watson, Wm., Ochterlony Mains, Forfar
 1881 Wedderspoon, George, Balgavies, Forfar
 1868 White, John P., Grain Merchant, Dundee
 1891 White, J. Martin, of Balruddery, Dundee
 1861 Whitton, And., of Couston, Newtyle
 1884 Whyte, Archibald, Spott, Kirriemuir
 1870 Whyte, Archibald, jun., Nether Hayston, Forfar
 1890 Whyte, James, Upper Hayston, Glamis
 1871 Whyte, John, West Denoon, Glamis
 1868 Whyte, William, Spott, Kirriemuir
 1881 Wilkie, James, Solicitor, Kirriemuir
 1888 Willsher, George, Pitpointie, Auchterhouse, Dundee
 1890 Wilson, Rev. John, The Manse, Liff, Dundee
 1878 Wilson, T. Mackay, Solicitor, Kirriemuir
 1890 Young, John, Balmyle, Meikle

KINROSS.

1882 ADAM, Sir Charles E., of Blairadam, Bart.
 1861 Anderson, Robert H., Tillyrie Cottage, Milnathort
 1868 Beath, David, Balado, Kinross
 1873 Begg, R. Burns, Sheriff-Clerk, Kinross
 1882 Beveridge, John, of Kinneston, Leslie, Fife
 1884 Bogie, Major, Bank Agent, Kinross
 1886 Ewing, Francis, Bank Agent, Milnathort
 1884 Ferguson, David, Burleigh, Kinross
 1884 Flockhart, Wm., Annacroich, Kinross
 1884 Greig, Andrew, of Holeton, Milnathort
 1883 Greig, John, of Tillyrie, Milnathort
 1885 Hepburn, John, V.S., Milnathort
 1871 Horn, John, of Thomanean, Milnathort
 1878 Mitchell, Jas., Aldie Castle, Fossoway
 1882 Montgomery, H. Jas., of Hattonburn, Milnathort
 1862 Morrison, J. B. B., of Finnerlie, Kinross
 1891 Reid, David, Thomanean, Kinross
 1871 Reid, George, of Tillyrie, Milnathort
 1871 Roxburgh, Robert, Seed Merchant, Kinross

Admitted

- 1881 Russell, T. Purves, of Warroch, Milnathort
 1890 Simpson, James, Mawcarse, Milnathort
 1878 Simpson, James, North Lethans, Kinross
 1884 Steedman, James, of Fruix, Kinross
 1884 Steedman, Thos., Bank Agent, Kinross
 1873 Terris, J., jun., Dullomuir, Blair Adam
 1870 Tod, Thomas M., West Brackly, Kinross
 1851 Tod, William, Gospetry, Milnathort
 1884 Tod, William, of East Brackly, Kinross
 1877 Walls, James, Lochran, Kinross
 1843 Young, Harry, of Cleish Castle, Kinross
 1891 Young, Robert, Sunnyside, Kinross

PERTH

(EASTERN DIVISION).

- 1878 Allan, John, Culthill, Dunkeld
 1887 Allan, William, Kinnon Park, Methven, Perth
 1874 Anderson, Alex., Berryhill, Dundee
 1870 Anderson, Archibald Turnbull, Perth
 1873 Anderson, Dr Arthur, C.B., Sunnybrae, Pitlochry
 1883 Anderson, D. A., Erich Lodge, Blairgowrie
 1879 Anderson, John, Castlehill, Blairgowrie
 1871 Anderson, John A., St Albans, Perth
 1878 Anderson, Peter, Duneaves, Fortingal
 1871 Anderson, Robert, Middlebank, Errol
 1890 Annand, David, Cotton of Craig, Glen Isla, Alyth
 1860*ATHOLE, The Duke of, K.T., Blair Castle, Blair Athole
 1841 ATHOLE, The Duchess Dowager of, Dunkeld
 1870 Ballingall, A. H., W.S., Perth
 1879 Beattie, James, Rockdale Cottage, Perth
 1887 Bell, Edwin W., Rossie, Forgandenny
 1887 Bell, James H., of Rossie, Forgandenny
 1884 Bett, Thomas, Urlar, Aberfeldy
 1873 Bisset, Thomas S., Blairgowrie
 1884 Black, Captain, of Balgowan, Perth
 1879 Black, George, Victoria Street, Perth
 1858 Borthwick, W. H., Government House, Blairgowrie
 1883†BREADALBANE, The Marquis of, Taymouth Castle, Aberfeldy
 1888 Brewster, James, Tarrylow, Balbeggie, Perth
 1873 Brock, Wm., Keithock Mains, Coupar-Angus
 1888 Brown, Chas., Tullyallan, Kincardine-on-Forth
 1871 Brown, Peter, Milton of Luncarty, Redgorton
 1882 Buchanan, Geo., Laguna House, Murthly
 1877 Butter, Albert, Union Bank, Perth
 1871 Cairns, Robert, Bertha Park, Perth
 1882 Calder, James, of Ardgare, Forgandenny
 1888 Cameron, Donald, Roro More, Aberfeldy
 1877 Cameron, Duncan, Kinloch Rannoch
 1876 Cameron, J. C., of Garrows, Dunkeld
 1887 Campbell, Lieut.-Col., General Prison, Perth
 1879 Campbell, Duncan, Stronach, Aberfeldy
 1846 Campbell, J. L., of Achalader, Blairgowrie
 1871 Chalmers, James, Shielhill, Stanley
 1879 Chalmers, John, Westwood, Stanley
 1890 Chisholm, Colin Edward, Grange of Elcho, Perth
 1881 Christie, Gilbert, Auchlyne, Killin
 1871 Chrystal, George, Engineer, Perth
 1871 Clark, Robert, Taybank House, Errol
 1881 Cowan, Walter, Kinmonth, Bridge of Earn

Admitted

- 1890 Cox, Albert E., of Dungarhill, Dunkeld
 1883 Cox, Wm., of Snaigow, Dunkeld
 1890 Cox, William Henry, yr. of Snaigow, Dunkeld
 1871 Crawford, Andrew, Tayhill, Perth
 1860 Crawford, William, Balgarvie, Perth
 1879 Dalgleish, Wm. Ogilvy, of Errol Park, Errol
 1846 Dickson, John, W.S., Greenbank, Perth
 1871 Doe, John, Errol
 1879 Dow, David, Balmanno, Bridge of Earn
 1879 Dow, David, jun., Balmanno, Bridge of Earn
 1884 Drysdale, John, Pitcullen Terrace, Perth
 1865 Duff, James, Freeland, Bridge of Earn
 1878 Dunn, William, Kenmore Mains, Aberfeldy
 1874 Fell, John Duncan, Flesher, Blairgowrie
 1868 Ferguson, Thos., Kinlochtry, Coupar-Angus
 1879 Ferguson, W. S., Pictston Hill, Perth
 1879 Fergusson, Donald, Dalcaon, Ballinluig
 1861 Fisher, Donald, The Hotel, Pitlochry
 1881 Fleming, Rev. A., of Inchyra, Hamilton House, Perth
 1870 Forbes, Charles W. L., Aberfeldy
 1879 Fraser, John M., Auction Mart, Perth
 1874 Galloway, Alex., C.E., Dirgarbh, Aberfeldy
 1890 Galloway, David, Grain Merchant, Perth
 1884 Galloway, Thomas T., Cairnie, Glencarse, Perth
 1884 Gammell, Colonel J. H. H., of Lethendy, Meikleour
 1871 Geekie, R., of Baldowrie, Rosemount, Blairgowrie
 1887 Gellatly, William, Balgowan, Perth
 1871 Gibson, Charles, Pitlochry
 1875 Gillespie, Jas. J., St Colmes, Ballinluig
 1873 Gold, Joseph, Murthly Farm, Perth
 1887 Gow, Geo., Dunalastair Hotel, Rannoch
 1881 Graham, A. G. Maxtone, yr. of Cultoquhey, Crieff
 1848 Graham, J. Maxtone, of Cultoquhey, Crieff
 1888 Grahame, John, Sheriff-Substitute, Woodend, Perth
 1887 Grant, George, Tullyneddie, Blairgowrie
 1879 Grant, John S., Tullynet, Ballinluig
 1889 Grant, Robt., The Pleasance, Coupar-Angus
 1879 Gray, E. A. Stuart, of Gray and Kinfauns, Perth (14 Atholl Cresc., Edinburgh)
 1880 Gray, George, of Bowerswell, Perth
 1861 Greig, T. Watson, of Glencarse, Perth
 1871 Grimond, Alex. D., of Gleniericht, Blairgowrie
 1871 Hagaurt, Peter, Breadalbane Mills, Aberfeldy
 1881 Hart, Andrew, Aberdalgie, Perth
 1870 Hay, Alex., Easter Cuthalundie, Perth
 1862 Hay, Colonel Drummond, of Seggieden, Perth
 1890 Haynes, George G., Camserney Cottage, Aberfeldy
 1871 Heiton, Andrew, Perth
 1889 Hollingworth, Alfred, Powgavie, Inchture
 1871 Hunter, Patrick, Waterybutts, Errol
 1843 Irvine, Dr Wm. S., Craigatin, Pitlochry
 1884 Jameson, Martin, Fernhill, Perth
 1852 Jameson, Melville, Solicitor, Perth
 1880 Jameson, Alexander, 31 Barossa Place, Perth
 1880 Jameson, John, 31 Barossa Place, Perth
 1890 Japp, William, of Broomhall, Alyth
 1871 Johnston, James, Cattle-dealer, Perth
 1871 Johnston, Stewart J., Loanleven, Huntingtontower, Perth

Admitted

- 1871 Kennedy, John, Royal George Hotel, Perth
 1881 Kerr, Thomas, Forehill, Caputh
 1878 KINCAIRNEY, The Hon. Lord, Dunkeld (6 Heriot Row, Edinburgh)
 1877 KINLOCH, Sir John G. S., of Kinloch, Bart., M.P., Meikle
 1879 KINNAIRD, Lord, Rossie Priory, Inchture
 1884 Kinnear, Chas., Tarsappie, Perth
 1853 KINNOUL, The Earl of, Dupplin Castle, Perth
 1879 Kyd, George, Perth
 1857 Latham, F. R., Taybank, Caputh, Dunkeld
 1879 Livingston, John, Brae of Cluny, Tullypowrie
 1861 Lowe, Robert, General Agent, Perth
 1884 Lumsden, J. D., Huntingtowerfield, Perth
 1883 Lumsden, T. W. M., Balharg, Meikle
 1871 M'Cash, John, Grain Merchant, Perth
 1880 M'Corquodale, William, Jeanie Bank, Scone
 1884 Macdiarmid, Donald, Bank of Scotland, Aberfeldy
 1858 M'Diarmid, D. A., Rockwood, Killin
 1875 M'Diarmid, Duncan, Camusericht, Rannoch
 1855 Macdonald, Archd. Burns, Perth
 1860 Macdonald, D., Athole Arms Hotel, Blair Athole
 1887 Macdonald, Duncan, Comrie Farm, Aberfeldy
 1890 M'Donald, James, City Mills, Perth
 1844 Macdonald, Lieut.-Col. Macdonald, of St Martin's, Perth
 1880 Macdonald, Montague, yr. of St Martins, Perth
 1861 Macdonald, William, of Balnakilly, Blairgowrie
 1871 Macdonald, William, Woodlands, Perth
 1860 M'Dougall, Archd., Ardtalanaig, Perthshire
 1871 M'Dougall, John, Goodlyburn, Perth
 1874 Macduff, Alex., of Bonhard, Perth
 1880 Macfarlane, David, Needburn, Methven
 1883 M'Gillhewie, R., Union Bank, Dunkeld
 1882 M'Gregor, Athole, Eastwood, Dunkeld
 1872 Macgregor, Donald, Dalnabo Cottage, Ballinluig
 1861 M'Gregor, John, Ladywell, Dunkeld
 1878 M'Intosh, James, Boatlands, Coupar Angus
 1862 MACKENZIE, Sir Alex. M., of Delvine, Bart., Dunkeld
 1890 Mackenzie, George A., Solicitor, Perth
 1885 Mackenzie, R. W. R., Stormontfield, Perth
 1873 Mackie, J. H. J., Invermay, Forgan-denny
 1879 M'Laren, Charles, Cally Lodge, Dunkeld
 1858 M'Laren, John, Retreat House, Scone
 1879 M'Laren, Wm., Pittendrigh, Meikleour
 1887 M'Lean, Neil, Battleby, Redgorton
 1880 MacLeish, Wm., Town-Clerk, Perth
 1881 M'Leish, Dan., Wester Keillor, Methven
 1877 M'Leish, G. S., Wester Drumatherty, Dunkeld
 1884 M'Leish, James, Byres of Murthly, Perth
 1890 M'Millan, David, Calvine, Struan
 1871 M'Naughton, Wm., Muirheadstone, Murthly
 1867 M'Niven, A., Innishewan, Killin
 1878 Macpherson, Allan, of Blairgowrie
 1885 Macpherson, Duncan, of Findynate, Tullypowrie
 1879 M'Queen, James, Princes Street, Perth

Admitted

- 1879 Macritchie, David, Easter Logie, Blairgowrie
 1833†MANSFIELD, The Earl of, K.T., Scone Palace, Perth
 1887 Marshall, Jas. Burt, of Luncarty, Perth
 1880 Marshall, Rev. Theodore, Caputh Manse, Dunkeld
 1885 Marshall, Robert, Toftthouse, Tibbermuir
 1887 Martin, Andrew, Perth
 1890 Martin, John Claude, Hilton, Perth
 1884 Matthew, John M., yr. of Auchmague, Perth
 1887 Maxwell, Wm., of Donavoured, Pitlochry
 1841 Menzies, Fletcher Norton, Balmacneil, Ballinluig - *Secretary of the Society*
 1879 Menzies, James, Coshieville, Aberfeldy
 1869 Menzies, Dr James, of Pitnacree, Ballinluig
 1877 Menzies, Neil James, yr. of Menzies
 1841 MENZIES, Sir Robert, of Menzies, Bart., Farleyer, Aberfeldy
 1879 Menzies, Robert, Tinnie, Aberfeldy
 1887 Menzies, Wm. J. B. Stewart, of Chesthill, Aberfeldy
 1887 Millar, Robert H., of Blair Castle, Culross
 1871 Millar, Wm., Over Kinfauns, Perth
 1861 Miller, George, Flowercraig, Errol
 1890 Miller, George A., W.S., Perth
 1877 Mitchell, Hugh, Banker, Pitlochry
 1882 Mollison, James, Ruthven, Meikle
 1888 Moncrieff, R. H., Potterhill, W.S., Perth
 1889 MONCRIEFFE, Sir Robt. D., of Moncrieffe, Bart., Perth
 1887 Morton, John, Muirton, Perth
 1879 Morton, R. G., Engineer, Errol
 1883 Munro, Chas., Union Bank, Aberfeldy
 1871 Murray, C. A., Taymount, Stanley
 1852 Murray, Thos. Graham, Stenton, Dunkeld
 1879 Nairne, T. G., Dunsinnan, Perth
 1874 Nairne, William, of Dunsinnan, Perth
 1870 Ogilvy, Col. James W., Rannagulzion, Blairgowrie
 1844 Ogilvy, Lieut.-Col. Thos. W., of Ruthven, Meikle
 1871 Panton, John, of Dalnagairn and Carsie, Blairgowrie
 1873 Panton, William, Maryfield, Blairgowrie
 1880 Paton, Jas., jun., Obney, Bankfoot
 1880 Peddie, William, 11 South Methven Street, Perth
 1884 Philp, Alex., Chapelhill, Logiealmond
 1871 Pirrie, James P., Coachbuilder, Perth
 1877 Pople, George, Newhouse, Perth
 1867 Pople, H. W., Royal British Hotel, Perth
 1861 Pople, J. B., of Newhouse, Letham House, Huntingtower, Perth
 1861 Powrie, Archd., Lairwell, Perth
 1871 Pullar, Robert, of Tayside, Perth
 1871 RAMSAY, Sir James H., of Bamff, Bart., Alyth
 1854 Rattray, Lieut.-Gen. J. C., of Craighall, C.B., Blairgowrie
 1874 Rattray, Dr J. C., of Coral Bank, Blairgowrie
 1884 Reid, W. A., Kingswood, Murthly
 1890 Richardson, Colonel Edmund R. Stewart, of Ballathue, Stanley
 1861 RICHARDSON, Sir J. T. S., of Pitfour, Bart., Perth
 1861 Richmond, John, Dron, Bridge of Earn
 1871 Richmond, T., Hilton, Perth
 1871 Robertson, Mrs. sen., of Struan, Rannoch
 1879 Robertson, Alex., Ballechin, Ballinluig
 1879 Robertson, Don., Blackhill, Ballinluig
 1880 Robertson, E. W., of Auchleeks, Blair Athole

Admitted

- 1881 Robertson, Jas., Blackhaugh, Dunkeld
 1851 Robertson, J. S., of Edradynate, Ballinluig
 1876 Robertson, J. S., yr. of Edradynate (Colquhalzie, Auchterarder)
 1864 Robertson, John, Old Blair, Blair Athole
 1879 Robertson, Wm., jun., of Craiglochie, Perth
 1883 Robertson, Wm., Potato Merchant, Perth
 1879 Robertson, Wm., Engineer, Perth
 1873 Rodgie, Henry, Letham House, Perth
 1871 Roy, Thomas, Craigclowan, Perth
 1887 Sandeman, Col. F. S., Stanley House, Stanley
 1891 Sandeman, Geo. G., of Fonab, Pitlochry
 1879 Scott, John, Gallin Cottage, Aberfeldy
 1883 Scrimgeour, Peter, Balboughty, Perth
 1891 Seaton, Donald, Cronan, Coupar-Angus
 1890 Sellar, James T., W.S., Perth
 1859 Small, James, of Dirnanear, Pitlochry
 1887 Smart, James, Architect, Perth
 1891 Smith, James, Drumbeltie, Lethendy, Meikleour
 1876 Smythe, David M., yr. of Methven, Perth
 1846 Smythe, William, of Methven, Perth
 1890 Spalding, John F., Leiffie, Alyth
 1889 Speedie, Matthew, Pitversie, Abernethy
 1881 Speid, James, Forneth, Dunkeld

Admitted

- 1890 Stead, W. F. Ballindean House, Inchture
 1880 Steel, Adam, yr. of Blackpark, Perth
 1879 Steuart, D. K., Munday, Aberdalgie, Perth
 1880 Steuart, John, of Ballechin, Tullypowrie
 1860 Stewart, Alex., 6 Market Street, Perth
 1858 Stewart, Charles, Tighndun, Killin
 1889 Stewart, Daniel, Muirhall, Perth
 1877 Stewart, Duncan, Loak, Bankfoot
 1881 Stewart, D. D., Castlehill, Inchture
 1888 Stewart, H. D., Strathgarry, Blair Athole
 1871 Stewart, James, Blair Athole
 1876 Stewart, James, Butcher, Coupar-Angus
 1883 Stewart, J. F., Newmill, Stanley
 1801 Stornmont, Viscount, Seone Palace, Perth
 1871 Sutherland, Geo., The Peel, Tibbermuir
 1878 Talbert, Peter, Gleniericht, Blairgowrie
 1881 Thomson, Thos., Cordon, Abernethy
 1873 Torry, Adam Ogilvie, St Ann's Cottage, Coupar-Angus—*Free Life Member*
 1841 Watson, William, Inchcoonans, Errol
 1881 Wedderspoon, Thos., Live Stock Salesman, Perth
 1862 White, Dr Francis, Perth
 1871 Whyte, Angus, Kipney Cottage, Harrietfield, Logiealmond, Perth
 1884 Whyte, Wm., Muirhead, Forgandenny
 1873 Wood, C. L., of Freeland, Forgandenny

3.—STIRLING DISTRICT.

EMBRACING THE

COUNTIES OF CLACKMANNAN, DUMBARTON, PERTH
(WESTERN DIVISION), AND STIRLING.

CLACKMANNAN.

Admitted

- 1880 Alexander, James, Inch of Ferryton, Clackmannan
1887 Alexander, William, Loanside, Clackmannan
1871 Allan, William, Grassmainston, Clackmannan
1881 Archibald, Francis, Blackfaulds, Alloa
1887 Arrol, Archd. T., Mill Grove, Alloa
1873†BALFOUR of Burleigh, Lord, Kennet, Alloa
1889 Blair, Charles, of Glenfoot, Tillicoultry
1872 Christie, John, of Cowden, Dollar
1850 Connal, Wm., Solsgirth, Dollar
1877 Crawford, John, High Street, Alloa
1872 Dewar, James, Balllisk, Dollar
1889 Dickie, Robert, Westertown, Dollar
1873 Drysdale, David, Lorns Hill, Alloa
1890 Drysdale, William, King o' Muirs, Alloa
1879 Ferguson, John, Forthview, Clackmannan
1875 Fernie, James A., Hilton, Alloa
1873 Fisher, Donald, Jellyholin, Alloa
1890 Fisher, Thomas, Jellyholm, Alloa
1888 Galashan, Alfred, Saddler, Alloa
1873 Galashan, Charles C., Saddler, Alloa
1878 Gibson, Thomas, Sherriffyards, Clackmannan
1874 Haig, J. R., of Blairhill, Dollar
1886 Haig, Robert, Dollarfield, Dollar—*Free Life Member*, 1887.
1875 Haig, W. J., of Dollarfield, Dollar
1858 Henderson, Robert, Nether Carsebridge, Alloa
1864 Kinross, John, Hillend House, Clackmannan
1874 Knox, Robert, Woodside, Cambus, Alloa
1888 Lang, James, Candleriggs, Alloa
1889 Leishman, William, of Broomrigg, Dollar
1882 M'Gregor, Alex., Craigton, Clackmannan
1885 M'Laren, J. T., Kennet, Alloa
1873 Macnab, James, of Middleton Kerse, Menstrie
1884 Macnab, John, Glenochil House, Menstrie
1890 Mair, William, Gartary, Clackmannan
1890 MAR and KELLIE, The Earl of, Alloa Park, Alloa
1857 Mitchell, Alex., Tillicoultry House, Tillicoultry
1848 Mitchell, Andrew, Alloa
1878 Moir, James M'Arthur, of Hillfoot, Dollar
1875 Orr, James, of Harvieston, Dollar
1869 Robertson, Rev. A. Irvine, Clackmannan
1881 Robertson, Alex., Schaw Park, Alloa
1878 Simpson, James, Tower, Alloa
1889 Sinclair, John, Harvieston Farm, Dollar

Admitted

- 1862 Smith, George, The Grange, Alloa
1879 Wilkie, David, Bridge Street, Dollar
1873 Young, George, Auctioneer, Dollar
1879 Younger, George, Brewer, Alloa
1889 Younger, James, Arns Brae House, Alloa

DUMBARTON.

- 1859 Anderson, John, Dullatur, Cumbernauld
1873 Anderson, John, Merkins, Alexandria
1873 Begg, Robert, Blarnie, Luss
1872 Bringan, A., Merchant, Helensburgh
1844 Brown, A. J. Dennistoun, of Balloch, Alexandria
1857 Buchanan, Alex. Norwood, Milngavie
1873 Buchanan, David, Garscadden Mains, New Kilpatrick
1873 BUCHANAN, Sir Geo. H. Leith, of Ross, Bart., Alexandria
1861 Burns, J. W., of Kilmahew, Cardross
1857 Calder, James, Colgrain, Cardross
1888 Campbell, Lady, of Garscube, Maryhill
1847 Campbell, J., of Tillichewan, Alexandria
1888 Campbell, J. A., Tillichewan Castle, Alexandria
1889 Campbell, Wm. Middleton, of Colgrain, Dumbarton
1873 Colquhoun, George, Shemore, Luss
1872 Colquhoun, Sir James, of Luss, Bart., Rossdhu, Luss
1881 Cullen, William, Barbegs, Croy
1857 Dalrymple, James, of Woodhead, Kirkintilloch
1850 Dennistoun, A. H., Rosslea, Helensburgh
1868 Douglas, Archd. C., of Mains, Milngavie
1861 Duncan, James, yr. of Auchendavie, Kirkintilloch
1881 Duncan, John, Auchenees, Croy
1881 Duncan, Thos., Dullatur, Cumbernauld
1857 Ewing, Alexander Crum, of Keppoch, Cardross
1880 Findlay, R. E., of Boturich, Alexandria
1872 Galbraith, John, Edentaggart, Luss
1885 Gardner, James, of Meikiehill, Kirkintilloch
1863 Gilmour, John, of Mount Vernon, Row
1881 Gilmour, William E., Woodbank, Alexandria
1881 Graham, George, jun., Easter Board, Gartshore, Croy
1861 Hain, David, Barremman, Clynder
1888 Hamilton, George, Succoth, Arrochar
1873 Jardine, Andrew, Balicemenoch, Helensburgh
1888 Kennedy, James, Chesters, New Kilpatrick
1854 Lang, William, Brook's Home, Cardross

Admitted

- 1873 Lennox, James, Shanhon, Luss
 1875 Lumsden, James, of Arden, Alexandria
 1883 M'Auslan, Peter, Letruait, Row
 1888 MacBrayne, David, yr. of Glenbranter, Auchenteil, Helensburgh
 1879 Macdonald, John, Belmore, Gareloch, Helensburgh
 1873 Macdonald John, Boquhanran, Dalnuir
 1851 M'Farlan, John, Faslane, Garelochhead
 1873 M'Farlane, Colin, Strone, Glenfruin, Garelochhead
 1873 M'Farlane, Duncan, Greenfield, Garelochhead
 1872 M'Indoe, James, Glenmolachan, Luss
 1865 Mackenzie, John, Letter Farm, Cove
 1838 Mackenzie, Robert D., of Caldervan, Alexandria
 1869 Mackenzie, Robert, yr. of Caldervan, Auchenfroe, Cardross
 1878 Mackinlay, William, Ardcho, Cardross
 1873 MacLachlan, Colin, Woodend, Helensburgh
 1888 M'Lean, Thos., Banker, Alexandria
 1872 M'Murich, James, Stuckievullich, Arrochar
 1873 M'Nab, Donald, Duchlage, Luss
 1882 M'Nab, Robt., Luss Hotel, Loch Lomond
 1876 M'Nair, Robert, Westertown, New Kilpatrick
 1884 Macpherson, A. H., Tarbet Hotel, Loch Lomond
 1867† Martin, John M., of Auchendennan, Alexandria, N.B.
 1884 Millar, James, Firkin, Arrochar
 1856 Milne, J., Union Bank of Scotland, Helensburgh
 1883 Murray, David, Moore Park, Cardross
 1881 Park, Alex., Gartshore, Croy, Glasgow
 1888 Renwick, Andrew, Gairbraud, Maryhill
 1882 Renwick, Robt., Dalnuir Farm, Dalnuir
 1876 Robertson, R. W., Rockingham, Kilcraggan
 1885 Smollet, P. B., of Bonhill, Cameron House, Alexandria
 1882 Whitelaw, Alex., of Gartshore, Croy
 1883 Wilson, James, Luss Estates Office, Helensburgh
 1881 Wright, W. Burt, of Auchinvoile, Croy
 1856 Young, James, Broadholm, Duntocher

PERTH

(WESTERN DIVISION).

- 1862 ABERCROMBY, Lord, Ferntower, Crieff
 1883 Anderson, A. H., Kippenross Estate Office, Dunblane
 1879 Anderson, James, Garbal Farm, Crianlarich, Stirling
 1857 Ballingall, D., Factor, Blairdrummond
 1873 Barty, Jas. W., Solicitor, Dunblane
 1864 Blair, James, Aberfoyle
 1883 Buchanan, Francis W., Leny, Callander
 1890 Buchanan, John, Inverardran, Crianlarich
 1865 Burns, James C., Fern Tower, Crieff
 1861 Cairns, William, Belhie, Auchterarder
 1871 Carrick, Charles, Baad, Stirling
 1872 Carrick, T. A., Easter Cambusdrennie, Stirling
 1882 Cochran, Wm., Overdale, Dunblane
 1874 Colquhoun, Rev. J. E. Campbell, Ledcameroch, Dunblane
 1882 Cox, George A., of Inverrossachs, Callander
 1882 Cox, James C., Inverrossachs, Callander
 1879 Craig, John, Invergeldie, Comrie—Free Life Member
 1880 Craig, William, Gwydyr House, Crieff—Free Life Member

Admitted

- 1883 Crawford, Thos., Dumawhance, Crieff
 1879 Cumming, David, Knockieston, Crieff
 1871 Curr, Henry, Pitkellony House, Muthill
 1878 Dayton, Robert, Lochearnhead
 1873 Dewar, James, Kinbuck, Dunblane
 1864 Dewhurst, G. C., of Aberuchil, Comrie
 1879 Dow, James, Clathybeg, Auchterarder
 1890 Duncan, Hector Macduff, yr. of Damside, Auchterarder
 1876 Dundas, Chas. Henry, Dunira, Crieff
 1882 Dundas, Colin M., Commander R.N., of Ochertyre, Stirling
 1864 Edington, Peter, Thornhill, Muthill
 1873 Edmond, William, Kippendavie Mains, Dunblane
 1887 Fletcher, Angus, Auchtertyre, Tyndrum
 1876 Forbes, Arthur Drummond, of Millearne, Auchterarder
 1861 Gardiner, Robert, of Rottearns, Henhill, Forteviot
 1859 Glover, Andrew, Lanrick Castle, Doune
 1884 Graeme, Robert, of Garvock, Bridge of Earn
 1858 Grieve, John, Woodbine, Callander
 1859 Grieve, Michael, Wolseley Park, Callander
 1857 Grieve, Robert, Glenfalloch, Crianlarich
 1869 Hamilton, J. B. B., of Arnprior, Callander
 1870 Hamilton, John, Conenish, Tyndrum
 1846 Hamilton, J. B., of Leny, Callander
 1873 Hart, Wm., Nether Garvock, Dunning
 1889 Holmes, James, Auchinteeck, Dunblane
 1884 Johnston, J. S., Fintalich, Muthill
 1863 Kay, Wm., Inch Farm, Kincardine-on-Forth
 1873 Kinross, Andrew, Hungryhill, Dunblane
 1871 Kinross, Thomas, Loig, Brae
 1861 Kirk, James, Kaimknow, Muckhart
 1874 Kirkland, Major-General, of Wester Foddell, Milnathort
 1878 Lee, A. H., of Blairhoyle, Port of Monteith
 1882 M'Ara, Alex., Culdees, Muthill
 1885 M'Callum, Col. Kellie, of Brae
 1887 M'Callum, Wm. R., Ballig, Crieff
 1873 M'Caull, Peter, Knockhill, Bridge of Allan
 1881 Macdonald, John M. S., of Monachyle, Lochearnhead
 1890 MacEwen, Daniel, Merchant, Callander
 1888 M'Ewen, John, Cambushinnie, Dunblane
 1865 M'Innes, Duncan, Milton Cottage, Crieff
 1881 Mackie, Peter, East Kirkton, Auchterarder
 1872 MacLachlan, James, Doune Lodge, Doune
 1871 M'Laren, James, Solicitor, Crieff
 1859 M'Laren, J., Brae of Monzievaired, Crieff
 1888 M'Laren, W. D., Drummorie, Blairdrummond
 1861 MacLean, Duncan, Belnollo, Crieff
 1873 M'Murich, Peter, Glen Allan, Dunblane
 1871 M'Naughton, John, Inverlochlarig, Balquhlder
 1879 M'Naughton, Robert, of Cowden, Comrie
 1871 M'Rostry, James, Solicitor, Crieff
 1872 Marshall, W. H., of Callander (25 Heriot Row, Edinburgh)
 1853 Millar, Hew, Newstead, Crieff
 1879 Millar, John, Lochland, Crieff
 1852† Moray, C. S. H. Drummond, of Blairdrummond, Stirling
 1869 Moray, Lieut.-Col. H. D., yr. of Blairdrummond, Stirling
 1882 Morgan, James, East Gogar, Blairlogie
 1882 Morris-Stirling, J. M., Gogar House, Stirling
 1882 Moubay, John James, of Naemoor, Dollar
 1853 Murdoch, John Burn, of Gartincaber, Blairdrummond, Stirling

Admitted

- 1880 Murray, Anthony G., of Dolerie, Crieff
 1879 Murray, David, Aberuchil, Crieff
 1873 Murray, John, Munnieston, Thornhill, Stirling
 1862 MURRAY, Sir Patrick Keith, of Ochertyre, Bart., Crieff
 1882 Paterson, John, Kirkton, Tyndrum
 1864 Reid, Walter, Craigarnhall, Bridge of Allan
 1887 Reid, Wm. M. David, Pittentian, Crieff
 1861 Robertson, David, Allan Hill House, Dunblane
 1864 Robertson, D. G., of Torrie, Callander
 1857 ROLLO, Lord, Duncrub House, Dunning
 1883 ROLLO, The Hon. The Master of
 1883 Rollo, James, Rosemount, Dunning
 1871 Ross, James E., Abercaurny, Crieff
 1867 Russell, Archibald, Kilbride Castle, Dunblane
 1872 Selby, Robert, Avenel, Crieff
 1830 Sharp, George R., Bardrill, Blackford
 1883 Sharp, John, South Forr, Crieff
 1882 Sheppard, Rev. H. A. G., of Rednock, Port of Monteith
 1870 Speir, R. T. A., Culdees Castle, Muthill
 1875 Stark, M. C., Westerton Farm, Doune
 1877 Stewart, Duncan, Callander
 1881 Stewart, Duncan, Monachyle, Callander
 1888 Stewart, Col. John, of Ardvorlich, R.A., Lochearnhead
 1873 Stewart, John, Bochastle, Callander
 1882 Stewart, Joseph, Crianlarich, Stirling
 1873 Stewart, Robert, Broom, Auchterarder
 1889 Stirling, Archd., of Keir, Dunblane
 1889 Stirling, James, Whiteston, Biao
 1879 Stirling, Patrick, of Kippendavie, Dunblane
 1839 Stirling, T. Graham, of Strowan, Crieff
 1890 STRATHALLAN, Viscount, Machany, Auchterarder
 1874 Thomson, Robt., Burnbank, Blairdrummond
 1885 Thomson, Samuel, Kames, Doune
 1889 Tress, George Russell, Callander
 1882 Wallace, John, of Glassengall, Dunblane
 1885 Watters, Thomas, Glenample, Lochearnhead
 1861 Williamson, Col. D. R., of Lawers, Crieff
 1864 Wilson, Alexander, Alford House, Dunblane
 1875 Wilson, John, Leeropt, Bridge of Allan
 1876 Young, Wm. S., Keir Mains, Dunblane

STIRLING.

- 1890 Adam, J. Denovan, Craigmill House, Stirling
 1864 Aitken, John G., Southfield, Stirling
 1878 Aitkenhead, Wm., Roughlands, Larbert
 1864 Bayne, John, Builder, Bridge of Allan
 1876 Best, John, Inveravon, Polmont
 1877 Binnie, Thomas, Auction Mart, Falkirk
 1890 Blackburn, Adam, Killearn House, Glasgow
 1876 Blackburn, James, Killearn House, Glasgow
 1882 Blair, Robert, Inversnaid Hotel, Loch Lomond
 1886 Bolton, Edwin, West Plean, Bannockburn
 1858 Bolton, J. C., of Carbrook, M.P., Larbert
 1879 Brown, Andrew, Kerse, Falkirk
 1882 Brown, John, Brownville, Kilsyth
 1882 Brown, John A. H., of Quarter, Dunipace
 1864 Buchanan, Alexander, Whitehouse, Stirling
 1877 Buchanan, D. M. B., of Boquhan, Killearn
 1877 Buchanan, John, Gartness, Killearn

Admitted

- 1876 Buchanan, Robert, Blairquosh, Strathblane
 1876 Buchanan, Robt., Letter Farm, Killearn
 1869 Bulloch, Archibald, Miliken, Maryhill
 1882 Buntine, J. R., Sheriff-Subt., Stirling
 1873 Burrell, James, Denovan Mains, Denny
 1864 Cairns, James, Balquharn, Menstrie
 1882 Campbell, Capt. Henry J. Fletcher, R.N., Boquhan, Kippen, Stirling
 1873 Christie, James, Coxethill, St. Ninians
 1877 CONNAL, Sir Michael, of Parkhall, Killearn
 1882 Couper, James, Craigforth, Stirling
 1881 Crierar, Alex., Craigton, Fintry, Glasgow
 1881 Dawson, John M., Elcho House, Balfroun
 1864 Dewar, A., Arnprior, Kippen
 1864 Dewar, Peter, King's Park, Stirling
 1864 Douie, J. R. L., Polmase, Stirling
 1890 Drummond, James W., Seed and Nursery Establishment, Stirling
 1873 Drysdale, Robert, Old Mills, Craigforth, Stirling
 1875 Duncan, A. R., Blairquosh, Strathblane
 1869 Edmond, David, of Ballochrum, Balfroun
 1881 Edmond, John, Gallanuir, Bannockburn
 1873 Edmond, Wm., Hillhead of Catter, Drymen
 1889 EDMONSTONE, Sir Archd., of Duntreath, Bart., Colzium, Kilsyth
 1862 Erskine, H. D., of Cardross, Stirling
 1882 Ewing, A. E. Orr, Cardross House, Stirling
 1851 EWING, Sir Archd. Orr, of Ballikrain, Bart., M.P., Killearn
 1890 Fisher, Donald, Ballanmnoch, Bucklyvie
 1864 Fleming, James, Carnmuirs, Falkirk
 1864 Forbes, William, of Callendar, Falkirk
 1888 Fraser, John, Balfunning, Drymen
 1868 Freeland, James, Broadgate, Strathblane
 1880 Galbraith, J., Croy Cunningham, New Killearn Station
 1873 Galbraith, T. L., Town-Clerk, Stirling
 1873 Gray, Andrew, West Plean, Bannockburn
 1873 Gray, James, Kerse Mains, Stirling
 1854 Gray, Patrick, Middle Strath, Falkirk
 1872 Guild, And., Rhoders, Alva
 1881 Hamilton, Alex., Commercial Bank, Stirling
 1859 Hamilton, W. F., The Elms, Lauriston, Falkirk
 1868 Hamilton, C. H., Dunmore Park, Larbert
 1878 Hay, James S., Clydesdale Bank, Falkirk
 1873 Henderson, A. W., Bridge of Allan
 1877 Henderson, William, of Redford, Linlithgow
 1864 Inglis, John, Kepdarroch, Gargunnoch
 1881 Jaffray, William, Broomridge, St. Ninians
 1877 Jardine, Wm., Bogside, Fintry
 1884 Kay, Andrew, Little Kerse, Kippen
 1875 Kay, Charles, Mill Farm, Gargunnoch
 1881 Kay, Robert, Mains Farm, Gargunnoch
 1852 Kemp, John, Implement Maker, Stirling
 1878 Ker, T. Ripley, yr. of Dougalston, Milngavie
 1857 Kerr, Robert, Ballikrain, Killearn
 1864 Kier, Thomas, Newlands, Falkirk
 1868 King, C. M., Antermony House, Milton of Campsie
 1857 KING, Sir James, of Campsie, Bart., Stirlingshire
 1864 Lang, John, Beild, Gargunnoch
 1869 Learmonth, T. L., of Park Hall, Polmont
 1884 Learmonth, Wm., Bowhouse, Grange-moath
 1864 Leishman, T., 25 Park Terrace, Stirling
 1863 Livingstone, T. L. Fenton, of West Quarter, Falkirk
 1885 Luke, John, Headswood, Denny
 1857 Macadam, John, Blair'er, Drymen
 1873 M'Alpine, James, Springfield, Stirling

Admitted

- 1857 Macfarlane, Lt.-Col. John, of Ballencle-
roch, Campsie Glen
1886 Macfarlane, Robt. C., West Carse, Stirling
1864 M'Indoe, Robert, Knowehead, Campsie
1889 M'Kean, John, Ballewan, Strathblane
1873 M'Lachlan, Archibald, 32 Queen Street,
Stirling
1887 M'Laren, D., Cornton, Bridge of Allan
1873 M'Laren, Jas., Cornton, Bridge of Allan
1881 Maclean, J. Grant., Norwood, Bridge of
Allan
1888 M'Onie, Wm., Ballochneck, Bucklyvie
1867 MAITLAND, Sir James R., of Barnton,
Bart., Craigend, Stirling
1880 Malcolm, W. T., Dunmore, Airth Station,
Stirling
1882 Melville, John H., Eriden, Falkirk
1890 Mitchell, David, Millfield, Polmont
1891 Mitchell, William, Blackdub, Stirling
1890 Moir, Alastair E. Graham, of Leckie,
Gargunnoch
1881 Moir, Alex., Nether Carse, Gargunnoch
1833 Monro, A. B., of Auchenbowie, Stirling
1876*† MONTROSE, The Duke of, Buchanan
Castle, Drymen
1876 More, John, Fordhead, Kippen
1873 Morrison, James M., Banker, Stirling
1880 Morton, David, Ironmonger, Stirling
1873 Muirhead, Wm., Pirnhall, Bannockburn
1881 Murray, Captain A. B., Gartur, Stirling
1880 Murray, Lieut.-Col. C. S., Sauchie, Stir-
ling
1873 Murray, James, Gartur, Stirling
1861† Murray, James, Catter House, Drymen
1890 Murray, J. Campbell, Blairquhosh,
Strathblane
1863 Murray, Lieut.-Col. John, of Polmaise,
Stirling
1873 Nimmo, Alex., of West Bank, Falkirk
1852 Nimmo, Matthew, Foot of Green, Stirling
1890 Paterson, Jas., Stock o' Broom, Stirling
1882 Paterson, Robert, Hill of Drip, Stirling
1873 Paton, John, of Viewforth, Stirling
1873 Paton, Robert, West Drip, Stirling
1873 Patrick, James, Queenzieburn, Kilsyth
1889 Peat, John, Manor, Blairlogie, Stirling
1864 Philp, Robert, Royal Hotel, Bridge of
Allan
1881 Pollock, J. J., of Auchineden, Strath-
blane
1891 Provan, John, Drum of Kinnaird, Larbert
1887 Pullar, Edmund, Coneychill House,
Bridge of Allan
1883 Rankin, Robert, Inchterf, Kirkintilloch
1868 Rankine, R. W., Rosebank, Falkirk
1880 Reid, Andrew, Haining Valley, Lin-
lithgow
1882 Rennie, James, Corrie, Kilsyth
1882 Risk, James, Drumbrae, Bridge of Allan
1852 Ritchie, Wm., West Pleau, Stirling
1873 Sands, James, Greenfoot, Gargunnoch

Admitted

- 1881 Scott, Rev. John, Camelon Manse,
Falkirk
1884 Scott, Thomas, South Woodend, Bonny-
bridge
1872 Scoular, John, Crook, Stirling
1887 Shanks, James, Headswood, Denny
1864 Sheriff, John Bell, Carronvale, Larbert
1881 Slessor, Rev. Alex., The Manse, Balforn
1857 Smith, Adam, Lochlands, Larbert
1864 Smith, Rbt., of Brentham Park, Stirling
1889 Speedie, John C., Rockdale, Stirling
1862 Stark, Ralph, of Summerford, Falkirk
1881 STEUART, Sir Alan H. Seton, of Touch,
Bart., Stirling
1882 Stevenson, John, Gateside, Denny
1851 Stewart, James, Burnbank, Croftamie,
Drymen
1879 Stewart, M. H. Shaw, of Carnock, M.P.,
Larbert
1868 STIRLING, Sir C. E. F., of Glorat, Bart.,
Milton of Campsie
1857 Stirling, Major G., of Craigbarnet,
Lennoxtown
1867 Stirling, James, of Garden, Kippen
1887 Stirling, Jas., North Broomage, Larbert
1865 Stirling, Col. John S., of Gargunnoch,
Stirling
1881 Stirling, Robert, Pendreich, Bridge of
Allan
1855 Stirling, William, of Tarduff, Linlithgow
1873 Taylor, James, Buchanan, Drymen
1890 Taylor, R., Craighead, Blairdrummond,
Stirling
1877 Taylor, Robert, Solicitor, Stirling
1879 Thomson, James, Coach Works, Stirling
1873 Thomson, William, Nyaa, Stirling
1881 Turnbull, Jas., Carnock Smithy, Larbert
1875 Ure, George, Wheatlands, Bonnybridge
1875 Ure, George R., Hope Park, Bonnybridge
1874 Ure, William, Bogton, Larbert
1858 Urquhart, J. G., of Vellore, Linlithgow
1872 Walker, William, Horse-dealer, Stirling
1873 Walls, Robert, Kerse Mills, Stirling
1890 Waters, J. C. Dun, of Craigton, Balforn
1877 Watson, John, Skipperton, Denny
1871 Waugh, Allan, Avonbridge, Falkirk
1881 Webster, James, Mungall Mill, Larbert
1881 Welsh, Patrick, Stirling
1864 Wilson, Alexander, Bannockburn House,
Bannockburn
1881 Wilson, David, jun., of Carbeth, Killearn
1864 Wilson, E. L., Bannockburn
1859 Wilson, John, of Auchineck, Killearn
1881 Wilson, William, Bannockburn House
Bannockburn
1891 Wilson, William Ralph, Hill Park, Ban-
nockburn
1867 Young, Andrew, 4 Clarendon Place, Stir-
ling
1879 Young, John, Cobblebrae, Falkirk
1873 Young, William, Taylorton, Stirling

4.—EDINBURGH DISTRICT.

EMBRACING THE

COUNTIES OF EDINBURGH, HADDINGTON, AND LINLITHGOW.

EDINBURGH.

Admitted

- 1878 Adam, Robert, City Chamberlain, Edinburgh
 1859 Ainslie, David, of Costerton, Blackshields
 1848 Ainslie, John, Hillend, Lothianburn
 1865 Aitchison, Lieut.-Col., of Drummorie, Musselburgh
 1877 Aitken, Dr A. P., 8 Clyde Street
 1854 Aitken, James, Fairhaven, Eskbank
 1854 Aitken, T., 11 Hope Street, Portobello
 1860 Aitken, T., 5 Grosvenor Crescent
 1889 Alexander, A., 34 St Andrew Square
 1851 Allan, James, Clifton, Mid-Caldor
 1873 Allan, Jn., 1 MacLaren Road, Newington
 1881 Amour, John, Cramond Bridge
 1877 Anderson, Charles, jun., 377 High Street
 1883 Anderson, J. M., S.S.C., 1 Strathearn Place
 1884 Anderson, J. R., W.S., 52 Palmerston Place
 1884 Anderson, R. K., 377 High Street
 1881 Anderson, W. M., Pirntaion, Stow
 1873 Andrew, Robert, Smeaton, Dalkeith
 1855 Archibald, T., of Viewbank, Lasswade
 1876 Archibald, T. B., 36 Craigmillar Park
 1869 Archibald, James, Overshiels, Fountain-hall
 1869 Archibald, John, Overshiels, Fountain-hall
 1887 Armstrong, W. J., 57 Manor Place
 1877 Auld, Peter, Buteland, Balerno
 1876 Baird, Colin C., V.S., Clyde Street
 1843 Baird, Sir James Gardiner, of Saughton Hall, Bart., Inch House, Liberton
 1877 Baird, Jn. W., 7 Union Street
 1879 Balfour, Professor I. B., Inverleith House
 1880 Balfour, J. H., 7 Glencairn Crescent
 1861 Bathgate, James, Middleton Lime Works, Gorebridge
 1854 Baxter, Edmund W., 9 Rutland Square
 1875 Bayley, George, 7 Randolph Crescent
 1876 Beith, Donald, W.S., 15 Grosvenor Crescent
 1882 Belfrage, A. J., 3 Durham Road, Portobello
 1871 Belfrage, A. W., C.E., 1 Erskine Place
 1849 Belfrage, J., 40 Craigmillar Park
 1871 Bell, John, of Castlecreevie, 35 Dublin Street
 1863 Berry, Walter, 11 Athole Crescent
 1877 Bertram, D. N., St Katherine's Works, Sciennes
 1883 Bertram, Hugh, Edinburgh
 1891 Black, A. D. M., W.S., 28 Castle Street
 1862 Blackwood, William, Gogar Mount, Ratho Station
 1874 Blair, John, W.S., 9 Ettrick Road
 1879 Blair, Patrick, W.S., 27 St Andrew Square
 1861 Blues, Andrew A., 29 Minto Street

Admitted

- 1884 Bodtker, Anker, 8 Commercial Street, Leith
 1846 Borthwick, John, of Crookston, Heriot
 1878 Brechin, James, 60 Queen Street
 1857 Brockley, Robert M., Gourlaw, Rosewell
 1859 Brodie, James, 9 Nelson Street
 1877 Brodie, Thomas D., W.S., 9 Ainslie Place
 1890 Brodie, William Alex. G., 15 Rutland Square
 1877 Brown, James, Spittal, Penicuik
 1881 Brown, Richard, C.A., 28 St Andrew Square
 1875 Brown, Thomas, Pentland Mains, Loanhead
 1882 Brown, Wm., Currievale, Currie
 1877 Brownlie, J., Bloom, Mid-Caldor
 1877 Bruce, E., 26 Greenside Place
 1885 Brunton, Wm., 4 Bernard Street, Leith
 1878 Bryce, And., Craigtintny, Edinburgh
 1853*† Buccleuch and Queensberry, The Duke of, K.T., Dalkeith House, Dalkeith
 1880 Buchan, Alex., LL.D., 72 Northumberland Street
 1882 Buchanan, Ben., Springbank, Corstorphine
 1872 Buchanan, John, C.E., 24 George Street
 1884 Burn, C. M. P., Prestonfield House, Edinburgh
 1877 Burnett, Alex. E., W.S., 129 George St.
 1838 Burnley, W. F., 24 Ainslie Place
 1882 Burton, M. B., 36 Findhorn Place
 1867 Burton, J. Tait, of Toxside, Gorebridge
 1857 Burton, J., 36 Findhorn Place
 1884 Byres, Wm., Baadsmill, West Calder
 1878 Caird, Alex. McNeel, 73 Inverleith Row
 1887 Cairns, Wm., Dairyman, Fountainbridge
 1851 Calder, W., 19 Archibald Place
 1886 Calder, William, 21 Commercial Street, Leith
 1887 Callander, Henry, of Preston Hall, Dalkeith
 1876 CAMPBELL, Sir Archd. S. L., of Succoth, Bart., 23 Moray Place
 1889 Campbell, Arthur, 4 Randolph Crescent
 1889 Campbell, George, W.S., 61 Castle Street
 1860 Campbell, James G., of Killyleoch, 23 Windsor Street
 1890 Campbell, P. W., W.S., 36 Castle Street
 1887 Campbell, W. G., 2 Rutland Square
 1889 Carfrae, Geo., C.E., 1 Erskine Place
 1869 Carphin, James R., C.A., 14 Hanover Street
 1887 Chene, Prof., 26 Charlotte Square
 1862 Christie, C. J., 6 Glenorchy Terrace
 1884 Christie, Wm., Ardvich Lodge, Liberton
 1855 Church, D. M., 27 Minto Street
 1864 Clapperton, Jn., Gillsland, Spylaw Road
 1883 Cleghorn, Thomas, Craigour, Liberton
 1876 CLERK, Sir George Douglas, of Penicuik, Bart.

Admitted

1875 Clerkson, Alex., Ormiston, Kirknewton
 1884 Cook, Charles, W.S., 61 Castle Street
 1882 Cook, Henry, W.S., 61 Castle Street
 1841 Cook, John, W.S., 11 Great King Street
 1885 Cook, Wm. Home, C.A., 1 Albyn Place
 1865 Cousin, George, 140 Princes Street
 1860 Cowan, C. W., of Logan House, Penicuik
 1872 Cowan, George, Valleyfield, Penicuik
 1874 Cowan, James, 35 Royal Terrace
 1858 Cowan, John, of Beeslack, Milton Bridge
 1879 Cowan, John, W.S., 12 Hill Street
 1879 Cowan, John, 13 South St Andrew St.
 1861 Cowan, Robert, W.S., 9 Carlton Terrace
 1862 Cowan, R., 13 Greenside Street
 1877 Crabbie, John M., 33 Chester Street
 1863 CRAIG, Sir J. H. Gibson, of Riccarton, Bart., Currie
 1877 Craig, Dr William, 7 Bruntsfield Place
 1877 Craik, John, The Bush, Roslin
 1838 Crichton, Hew, S.S.C., 13 Nelson Street
 1849 Crichton, Hew Hamilton, W.S., 13 Nelson Street
 1878 Crichton, James, 47 George Street
 1847 Crichton, Jas. Arthur, 13 Nelson Street
 1875 Croall, Robt., Craigcrook Castle, Blackhall
 1883 Cross, Adam P., Bowling Green Street, Leith
 1870 Cunningham, C., V.S., Slateford
 1888 Cunningham, Geo. M., C.E., 135 George Street
 1883 Cunningham, St Clair, Bowling Green Street, Leith
 1877 CUNNINGHAM, Sir R. K. A. Dick, of Prestonfield, Bart.
 1867 Currer, David, 25 Northumberland St.
 1873 Currer, P. R., Myrside, Edinburgh
 1875 Dalgleish, Geo., Rosebery Mains, Gorebridge
 1857 Dalgleish, John J., 8 Athole Crescent
 1858 Dalgleish, L., 1 Rutland Square
 1888 DALKEITH, The Earl of, Dalkeith Palace, Dalkeith
 1882 Dallas, D. F., S.S.C., 24 Charlotte Square
 1862 DALRYMPLE, Sir Charles, of New Hailes, Bart., M.P., Musselburgh
 1873 Dalziel, George, W.S., 66 Queen Street
 1888 Dalziel, William, Muirhousedyke, West Calder
 1883 Darling, J. F. Stormonth, 38 Palmerston Place
 1877 Davidson, James J., Saughton Mains, Gorgie
 1850 Davidson, W. J., 32 Drumshuegh Gardens
 1888 Davidson, W. S., 54 Castle Street
 1850 Deans, Peter D., Mount Charles, Portobello
 1877 Dewar, James Cumming, of Vogrie, Ford
 1884 Dickson, James, Damhead, Loanhead
 1850 Dickson, James J., C.A., 122 George St.
 1879 Dickson, T. G., 3 North St David Street
 1878 Dickson, W. T., W.S., 11 Hill Street
 1866 Dobbie, John, Campeud, Dalkeith
 1886 Dobbie, John, Contractor, Leith
 1889 Dods, Archibald, Halfhawkiln, Gorebridge
 1884 Douglas, James, Cousland, Dalkeith
 1885 Douglas, William, Beaver Bank, Canonmills
 1858 Dowell, Alex., 18 Palmerston Place
 1869 Downie, Hay, Corstorphine
 1858 Drybrough, Thos., 81 Royal Terrace
 1880 Dun, Finlay, 130 George Street
 1884 Duncan, Peter, Eskbank, Dalkeith
 1848 Duncan, William, S.S.C., 13 Abercromby Place
 1876 Duncan, William, S.S.C., 18 York Place
 1882 Dundas, D., Advocate, late 46 Heriot Row

Admitted

1878 Dundas, Ralph, W.S., 16 St Andrew Sq.
 1847 Dundas, Robert, of Arniston, Gorebridge
 1880 Dundas, William J., C.S., 16 St Andrew Square
 1872 Dunlop, George, W.S., 20 Castle Street
 1877 Dunn, Malcolm, The Gardens, Dalkeith
 1878 Dykes, James, Cuckien, Penicuik
 1874 Edgar, John, Kirkettle, Roslin
 1877 Elder, James, Rodinglaw, Currie
 1869 ELPHINSTONE, Lord, Cauberry Tower, Musselburgh
 1874 Fergus, W., 1 Queen's Place, Leith Walk
 1876 Ferguson, Archd. A., 196 High Street, Portobello
 1863 Ferguson, John, Burghlee, Loanhead
 1864 Field, Rev. E. B., 12 Douglas Crescent
 1869 Finlay, John H., W.S., Register House
 1882 Fleming, Jas. S., Royal Bank of Scotland
 1835 Forbes, W., of Medwyn, 17 Ainslie Place
 1878 Ford, G., Saughton Hall Mains, Murrayfield
 1868 Fordyce, J. D., 34 Great King Street
 1871 Foran, Andrew, 14 Claremont Terrace
 1863 Forman, John, 51 Great King Street
 1882 Forrester, John, 39 Broughton Place
 1877 Foulis, David, 61 George Street
 1869 Foulis, Sir Jas. Liston, Bart., Millburn Tower, Corstorphine
 1868 Fraser, Alex., Canonmills Lodge
 1857 Gardner, Geo., Carrington Barns, Gorebridge
 1877 Gardner, Wm., East Langton, Mid-Calder
 1886 Garson, Wm., Solicitor, 5 Albyn Place
 1887 Geddes, G. H., 21 Young Street
 1863 Gibson, James, 2 Chalmers Crescent
 1869 Gibson, T., Bainfield, Fountainbridge
 1847 GILLESPIE, Sir John, W.S., 53 Northumberland Street
 1890 Gilmonr, R. Wolridge Gordon, of Craigmillar
 1869 Glendinning, G. R., Hatton Mains, Wilkieston
 1874 Glendinning, J. P., Overshields, Mid-Calder
 1865 Goldie, R. G. M., 3 Comely Green Place
 1883 Gow, Andrew, Cranston Riddell, Dalkeith
 1887 Graham, William, 9 Hill Street
 1861 Gray, James, Braehead Mains, Cramond Bridge
 1884 Gray, James, Harperigg, Kirknewton
 1878 Gray, Robert Smith, Southfield, Duddingston
 1877 Greig, R. M., Fountainbridge
 1889 Grey, John Edward, 20 Lauriston Place
 1869 Grieve, John, Balmoral Hotel, Princes St.
 1877 Gulland, W. J., Monkton Hall, Musselburgh
 1869 Hagart, J. V., W.S., 140 Princes Street
 1864 Halkett, Lieut.-Col. J. C., of Cramond
 1878 Hamilton, Robert, 29 St James Square
 1864 Hamilton, Wm., of Cairns, Kirknewton
 1843 Handyside, W., 21 Magdala Crescent
 1884 Harper, James, Fordel, Dalkeith
 1871 Harper, William, Sheriffhall Mains, Dalkeith
 1875 Hay, Alex., 96 Constitution Street, Leith
 1862 Hay, James, 9 Castle Street
 1876 Henderson, John, C.A., 15 Polwarth Gardens
 1854 Henderson, Thos., 6 Saville Road
 1863 Higgins, Robert, 4 Garscube Terrace, Murrayfield
 1863 Hogg, Henry, Symington Mains, Stow
 1876 Hogg, Robert, 18 Ann Street
 1869 Hogg, Robert, Rosemay, Leadburn
 1880 Hogg, Thos., Orenford Mains, Dalkeith
 1858 Hood, Archibald, Rosewell
 1878 Hope, Alex., Pinkie House, Musselburgh
 1848 Hope, Jas., of Belmont, Murrayfield

Admitted

- 1877 Hope, James Edward, New Club
 1878 Hope, Sir John David, of Pinkie, Bart.
 1884 Howe, Alex., W.S., 32 Charlotte Square
 1887 Howie, Archibald, Rosebery, Gorebridge
 1875 Hunter, John, Nethershiel, East Calder
 1877 Hunter, J., jun., Woodhall Mains, Juniper Green
 1862 Hunter, Robt., 10 Ainslie Place
 1853 Hunter, Wm. B., Aracan Cottage, Musselburgh
 1872 Hutchison, J. T., 12 Douglas Crescent
 1858 Hutchison, Robert, 11 Bellevue Crescent
 1875 Hutchison, Thos., Bellfield, Duddingston
 1875 Hutchison, Thos., Broomhills, Loanhead
 1883 Inch, Adam, South House, Liberton
 1877 Inch, Robert, 1 Victoria Street
 1869 Inglis, A. W., 30 Abercromby Place
 1884 Inglis, H. H., W.S., 8 North St David St.
 1852 Inglis, Right Hon. John, Lord Justice-General, 30 Abercromby Place
 1865 Inglis, Peter, East Pilton, Ferry Road
 1887 Innes, John C., W.S., 11 Moray Place
 1872 Jack, Gavin, Swanston, Lothianburn
 1860 Jack, Samuel, Crichton Mains, Dalkeith
 1869 Jack, Thomas, Hermiston, Currie
 1885 Jameson, Andrew, Advocate, 3 St Colme Street
 1860 Jamieson, G. A., C.A., 24 St Andrew Sq.
 1874 Jamieson, J. A., W.S., 66 Queen Street
 1858 Jamieson, Wm. H., Thornlie Villa, Loanhead
 1850 JARDINE, Sir Alex., Bart., Granton House, Edinburgh
 1869 Jeffery, David, 14 Randolph Crescent
 1880 Jenkinson, A. D., 10 Princes Street
 1872 Johnson, W. H., Tweed Villa, Kelugas Road
 1852 Johnston, Alex., Hailes, Slateford
 1877 Johnston, L., 11 Castle Street
 1862 Jones, Charles Digby, 14 Lynedoch Place
 1863 Kay, Wm., Broomieknowe, Lasswade
 1860 Kennaway, Robt., 10 Middleby Street
 1888 Kerr, George, 9 Great Stuart Street
 1859 Kerr, John, Broomhouse, Corstorphine
 1884 Kerr, John, jun., Yorkston, Gorebridge
 1889 Kerr, Thomas, W.S., 16 Hill Street
 1869 Kidd, Walter, Baileny, Currie
 1872 King, James, West Mills, Colinton
 1871 King, J. F., Chambers Street
 1876 Kinnear, C. G. H., 12 Grosvenor Cres.
 1877 Laing, Alex., S.S.C., Glenord, Spylaw Road
 1884 Lamond, Robert, Malcolmstone, Currie
 1866 Lamont, John, 2 Hope Street
 1878 Landale, James, 1 Summerfield, Leith
 1855 Landale, Thomas, 5 Chalmers Crescent
 1868 Lauder, Alex., Goshen, Musselburgh
 1877 Laurence, P., 6 George Street
 1872 Lawrie, John W., Stow
 1872 Lawrie, Thos., Esperston, Gorebridge
 1857 Leslie, Jas., 22 Duke Street, Edinburgh
 1884 Lindsay, Robert, Royal Botanic Garden
 1889 Lindsay, W. P., W.S., 16 Queen Street
 1866 Lockhart, R., jun., 10 Polwarth Terrace
 1884 Logan, C. B., W.S., 23 Queen Street
 1891 Lowe, W. D., W.S., 66 Queen Street
 1850 Lyall, Robt., Rosefield Place, Portobello
 1859 Macadam, Dr S., Surgeons' Hall
 1884 Macadam, Prof. W. Ivison, Surgeons' Hall
 1885 M'Alpine, A. N., Minto House, Chambers Street
 1874 McCallum, A. I., 19 Grassmarket
 1864 M'Candlish, John M., 27 Drumsheugh Gardens
 1860 M'Culloch, R. C., 7 Broughton Place
 1891 Macdonald, Charles, Editor 'Farming World,' 63 Princes Street
 1886 Macdonald, R. B., Granton Mains, Edin.
 1875 M'Dougal, Thos., Eskvale, Penicuik

Admitted

- 1870 M'Dowall, Andrew, Harelaw, Currie
 1877 M'Fadyean, Prof. J., Veterinary College, 8 Clyde Street
 1862 Macfie, C., of Gogarburn, Corstorphine
 1865 Macfie, D. J., of Borthwick Hall, Heriot
 1864 Macfie, R. A., of Dregthorn, Colinton
 1869 Macfie, Wm., of Clermiston, Corstorphine
 1877 M'Gowan, Robert, 46 Fountainhall Road
 1870 M'Gowan, William, 46 Fountainhall Rd.
 1884 M'Kay, W. B., 17 Lennox Street
 1846 Mackenzie, Alex., of Scatwell, 33 Melville Street
 1869 Mackenzie, A. K., of Ravelrig, 19 Grosvenor Crescent
 1879 Mackenzie, A. D., 6 Hartington Gardens
 1884 Mackenzie, D. F., Morton Hall, Liberton
 1848 Mackenzie, John, New Club
 1879 Mackenzie, John, W.S., 16 Royal Circus
 1818 Mackenzie, J. Ord, W.S., 9 Hill Street
 1853 MACLAGAN, Prof. Sir Douglas, 28 Heriot Row
 1873 MacLagan, R. C., M.D., 5 Coates Crescent
 1881 M'Laren, Alex., 11 Assembly St., Leith
 1883 Macpherson, C. E. W., C.A., 28 St Andrew Square
 1862 Macpherson, Geo. Gordon, New Club, Edinburgh
 1882 Macpherson, Prof. N., 2 Randolph Cliff
 1877 Maitland, David, of Dundhennan, New Club
 1879 Maitland, Col. K. Ramsay, 26 Castle Ter.
 1882 Mann, W., S.S.C., 119 Princes Street
 1877 Mark, Robert, Valleyfield Street
 1886 Massie, W. H., 1 Waterloo Place
 1875 Mather, Edward, The Lee, Edinburgh
 1871 Matthew, P. M., 32 Coates Gardens
 1885 Maxwell, Jas., Glencorse Mains, Milton Bridge
 1859 Mears, Wm., 19 Ferry Road
 1849 Melvin, Jas., 43 Drumsheugh Gardens
 1863 Menzies, D., C.E., 39 York Place
 1871 Menzies, Robert, S.S.C., 16 Duke Street
 1870 Menzies, William J., W.S., 123 George Street
 1870 Merrick, H. J., Hay Mains, Harburn, West Calder
 1870 Merricks, J. L., Gunpowder Mills, Roslin
 1884 Methven, John, 6 Bellevue Crescent
 1882 Mill, George, 21 St Andrew Square
 1883 Milne, Alex., 32 Hanover Street
 1887 Mitchell, David, Lauriston, Davidson's Mains
 1869 Mitchell, Wm., S.S.C., 11 South Charlotte Street
 1876 Moir, Peter, 74 Nicolson Street
 1848 MONCREIFF, Lord, 15 Great Stuart Street
 1885 MONCREIFF, Hon. Jas. W., 6 Ainslie Pl.
 1860 Moncrieff, D. S., W.S., 24 George Square
 1872 Mortimer, T. A., 86 George Street
 1884 Morton, Thomas, Redheugh, Gorebridge
 1886 MORTON, The Earl of, Dalnahoo, Wilkieston
 1887 Mungle, John T., West Calder
 1886 Munro, John C., yr. of Marchbank, Balerno
 1880 Munro, William, of Marchbank, Balerno
 1875 Murdoch, Geo. Burn, 31 Morningside Road—Free Life Member
 1847 MURK, Hon. Lord, 12 Ainslie Place
 1870 Mure, William J., 39 Heriot Row
 1877 Murray, A. G., 7 Rothesay Terrace
 1875 Murray, R. W. E., Blackford House, Blackford Avenue—Free Life Member
 1857 Murray, Thomas, Braidwood, Penicuik
 1890 Murray, T. M., W.S., 13 Hill Street
 1885 Murray, William Hugh, W.S., 48 Castle Street
 1875 Mutter, J., 29 Chalmers Street
 1890 Mylne, James, W.S., 36 Castle Street
 1888 Naismith, R. T., 18 St Andrew Square

Admitted

- 1890 Nisbet, Chris. C., of Stobshiell, W.S., 23 York Place
 1847 Nisbett, J. M., of Cairnhill, Drum, Edin.
 1860 Niven, A. T., C.A., 16 Young Street
 1802 Norie, H. H., Union Bank, Edinburgh
 1876 Owens, William R., Leith
 1874 Park, Ebenezer, Greenside Lane
 1863 Park, James, Stoneyhill, Musselburgh
 1873 Park, J. D., Greenside Lane
 1874 Park, William, Brunstane, Portobello
 1889 Pate, Thomas, Windydoors, Stow
 1864 Paterson, D. A., Merchant, Leith
 1877 Paterson, George, Falhills, Penicnik
 1878 Paterson, James, of Bankton, Mid-Calder
 1877 Paterson, John, Meadowspott, Dalkeith
 1876 Paterson, J. T. S., 55 Grange Loan
 1877 Paterson, Richard L., Langside, Dalkeith
 1869 Paterson, Thos., W.S., 81A George Street
 1890 Patten, Hugh, W.S., 59 Frederick Street
 1880 Paul, George M., C.S., 16 St Andrew Sq.
 1884 Pearson, A. G., of Luce, 5 Rothesay Pl.
 1878 Pendreigh, George, Catcune, Gorebridge
 1871 Petrie, S. F., 350 Leith Walk
 1879 Philip, David, S.S.C., 41 Charlotte Sq.
 1859 Pitman, Frederick, W.S., 11 Great Stuart Street
 1860 Plummer, J., 15 Greenhill Terrace
 1880 Pott, George, of Potburn, 55 Albany St.
 1863 Pringle, D., Torquhan, Stow
 1876 Pringle, J., 5 Tipperlinn Road
 1877 Pringle, Wm., Huntly Cot, Gorebridge
 1868 Proudfoot, T., Monkton Lodge, 62 St Alban's Road
 1889 Rachburn, Norman, 49 Manor Place—*Free Life Member*
 1881 Ramsay, R. G. Wardlaw, of Whitehill, Rosewell
 1890 Ramsay, William, of Bowland, Stow
 1874 Rankine, Prof. John, 23 Anslie Place
 1887 Readman, J. B., 9 Moray Place
 1883 Reid, R. C., C.E., 72 George Street
 1879 Renwick, Wm., Meadowfield, Corstonphine
 1885 Rew, William, 4 Bernard Street, Leith
 1884 Richard, John Millar, 20 Grosvenor Cres.
 1877 Riddell, A., 5 Grassmarket
 1854 Riddell, Thos., Ramsay Villa, Musselburgh
 1869 Ritchie, Charles, S S C., 20 Hill Street
 1877 Ritchie, D., 13 Windsor Street
 1865 Ritchie, W., of Middleton, Gorebridge
 1853 Ritchie, W., Woolmet, Dalkeith
 1876 Robertson, Duncan, 73 Great King Street
 1884 Robertson, J. A., C.A., 33 Charlotte Sq.
 1889 Robertson, Rt. Hon. J. P. B., Q.C., M.P., Lord Advocate, 19 Drumshough Gardens
 1850 Routhead, D., 21 Grosvenor Street
 1860 Rutherford, G., Monteat's Houses, Gorebridge
 1887 Rutherford, Richard, V.S., Bread Street
 1880 St Clair, J. S., 99 High Street, Musselburgh
 1884 Sanderson, James, 8 Manor Place
 1864 Sanderson, Wm., Mount Lothian, Eskbank
 1854 Scoon, K., 46 Rankellor Street
 1876 Scott, Alex., 3 Bellfield, Portobello
 1876 Scott, A. T. S., 1 Hill Street
 1891 Scott, Rev. Arch., D.D., 16 Rothesay Place—*Chaplain to the Society*
 1880 Scott, E. E., C.A., 64 Queen Street
 1885 Scott, Prof. John, 32 Morningside Road
 1861 Scott, Lord Walter, Dalkeith
 1848 Seton, George, Edinburgh
 1863 Shand, Hon. Lord, 30 Heriot Row
 1870 Shand, John, M.D., 8 Albany Street
 1889 Shiells, James, Muirhouse, Stow
 1860 Simpson, Alex., Wallyford, Musselburgh

Admitted

- 1887 Simpson, James, Ingliston, Ratho
 1878 Simpson, Thomas, Duddingston, Portobello
 1874 Simson, C. S., 47 Queen Street
 1831 Skene, Wm. F., W.S., 20 Inverleith Row
 1869 Skinner, W., of Corra, W.S., 35 George Square
 1846 Skirving, R. Scot, 29 Drummond Place
 1886 Skirving, Thos. M., Niddrie Mains, Liberton
 1889 Slimon, Robert, of Whitburgh, Ford, Dalkeith
 1877 Small, James, Commercial Bank, Edin.
 1884 Smart, Alex., Bow, Stow.
 1864 Smart, Jas., Liberton Park, Liberton
 1880 Smart, J. C., 54 George Square
 1881 Smith, A. D., C.A., 29 St Andrew Sq.
 1878 Smith, J., 89 Grassmarket
 1867 Smith, J. Turnbull, C.A., 5 Belgrave Pl.
 1872 Smith, Robt. G., Georgeville, Mid-Calder
 1884 Smith, Thomas H., National Bank, Edinburgh
 1881 Somerville, William, B.Sc., F.R.S.E., of Cormiston, Lecturer on Forestry, Edinburgh University—*Free Life Member*, 1887
 1854 Starforth, John, Architect, 37 York Pl.
 1870 Steel, Lt.-Col. G. Mure, 4 Athole Cres.
 1874 Steell, Gourlay, R.S.A., 4 Palmerston Place
 1861 Stenhouse, Jas., Turnhouse, Cramond Bridge
 1888 Stenhouse, John, jun., 13 Blacket Place
 1861 Steuart, James, Dalkeith Park, Dalkeith
 1855 Stevenson, Andrew, 18 Royal Circus
 1886 Stevenson, David Alan, C.E., 84 George Street
 1852 Stevenson, Thomas, 12 Brighton Place, Portobello
 1887 Stewart, J. C., 30 Heriot Row
 1884 Stewart, J. H., Selms, Kirknewton
 1878 Stodart, J. A., 1 Melville Terrace, Eskbank
 1890 Stoddart, James Edward, of Howden, Mid-Calder
 1878 Strathern, Robt., W.S., 12 South Charlotte Street
 1874 Stratton, David, 13 Middleby Street
 1853 Sutherland, Eric, Enfield, Lasswade
 1865 Sutherland, Jas. B., S.S.C., 10 Windsor Street
 1858 Swan, James, 47 Lauriston Place
 1858 Swan, Thomas, 47 Lauriston Place
 1889 Sydeserff, John Buchan (Ruchlaw), National Bank, 142 Princes Street
 1874 Syme, David, 1 George IV Bridge
 1885 Syme, David Fraser, C.A., 11 York Buildings
 1875 Syme, James, Millbank, Edinburgh
 1876 Symington, Jas., 55 Fountainhall Road
 1862 Tawse, John, W.S., 11 Royal Terrace
 1863 Taylor, Alex., Pailhead, Ford
 1884 Taylor, Peter, Lochend
 1872 Taylor, Thos., Seed Merchant, Dalkeith
 1879 Them, Albert M., Windsor Hotel, Princes Street
 1884 Thin, John, Ferniehurst, Stow
 1874 Thoms, Geo. Hunter, 18 Charlotte Square
 1880 Thomson, Andrew, 15 Inverleith Place
 1867 Thomson, Chas. W., C.A., 16 Lennox St.
 1889 Thomson, George Munro, W.S., 1 Drumshough Place
 1858 Thomson, James, 53 George Street
 1867 Thomson, John Comrie, 30 Moray Place
 1870 Thomson, Lockhart, S.S.C., 114 George Street
 1873 Thomson, Mitchell, 12 Queen Street
 1859 Thomson, Peter, Conservative Club, Princes Street

Admitted

- 1888 Thomson, Robert, Rusha, West Calder
 1872 Thomson, W. A., 13 Dock Street, Leith
 1884 Thorburn, David, Brockhouse, Stow
 1872 Thyne, John, 21 Danube Street
 1869 Tod, James C., Currie
 1870 Tod, John W., W.S., 66 Queen Street
 1876 Todd, David, 2 Dick Place
 1865 Todd, Jas., 72 Craiglea Drive
 1871 Torrance, Archibald P., Kippiclaw, Dalkeith
 1877 Torrance, T. A., Camps, Wilkieston
 1872 Torrance, W., Camps Lime Works, Wilkieston
 1846 Traquair, Ramsay H., Colinton
 1865 Trotter, Coutts, 17 Charlotte Square
 1865 Trotter, Lieut.-Col. H., of Morton Hall, Liberton
 1869 Trotter, Lieut.-Col. R. A., of the Bush, Roslin
 1878 Tuke, Dr J. B., Saughton Hall
 1874 Turnbull, David, W.S., 5 South Charlotte Street
 1868 TURNER, Prof. Sir W., M.B., 6 Eton Terrace
 1863 Tytler, James Stuart, W.S., 22 Young Street
 1885 Usher, John, of Norton, Ratho
 1864 Veitch, Chris., 11 Rothesay Place
 1874 Waddell, A. Peddie, 6 Albyn Place
 1888 Waddell, George, 4 St Andrew Square
 1874 Waddell, George, 8 Pentland Terrace
 1857 Wakelin, John, Oil Mills, Musselburgh
 1877 Walcott, John, 13 Greenside Place
 1870 Walker, Alexander, Stagebank, Heriot
 1872 Walker, Alex. J., 5 Manor Place
 1860 Walker, James, of Dalry, Hanley, Corstorphine
 1882 Walker, R. H., of Hartwood, West Calder
 1884 Walker, James, Limefield House, West Calder
 1835 WALKER, Sir W.S., K.C.B., 125 George St.
 1890 Wallace, Andrew, 3 Bernard Street, Leith
 1878 Wallace, Prof. Robert, University, Edinburgh—*Free Life Member*
 1885 Wallace, S. W., Brunstane House, Joppa
 1872 Walley, Thos., Principal, Veterinary College, Clyde Street
 1860 Wardrop, W. M., The Buggies, Craiglockhart, Slateford
 1858 WARRENDER, Sir G., of Lochend, Bart., Bruntisfield House
 1837 Waterston, Charles, 39 Albany Street
 1869 Watherston, James, 29 Queensferry St.
 1869 Watherston, Wm., 29 Queensferry Street
 1882 Watson, G. G., W.S., 45 Charlotte Sq.
 1878 Watson, Jas. Graham, 45 Charlotte Sq.
 1870 Watson, James M., 2 Fingal Place
 1884 Wauchope, Lieut.-Colonel A. S., of Nidrie Marischall, Liberton
 1842 WAUCHOPE, Sir John Don, of Edmonstone, Bart., 11 Ainslie Place
 1882 Wauchope, J. D. D., yr. of Edmonstone, 11 Ainslie Place
 1863 Webster, J., 12 Brunstane Road, Portobello
 1886 Welsh, W. M., 1 Waterloo Place
 1877 Welwood, J. A. Maconochie, Meadowbank House, Kirknewton
 1884 Wenley, James A., Bank of Scotland
 1876 White, James, Stagehall, Stow
 1890 White, John, Lugate, Stow
 1872 White, Robert, Osterston, Gorebridge
 1889 White, William, Lugate, Stow
 1850 Whittet, George, Easter Drylaw, Davidson's Mains
 1884 Wight, Robert, Suffolk House, Suffolk Road
 1884 Wilkie, Captain W., of Ormiston, Kirknewton

Admitted

- 1873 Will, Robert W., S.S.C., 37 Queen Street
 1867 Williams, W., Principal, New Veterinary College, Leith Walk
 1881 Williams, W. O., New Veterinary College, Leith Walk
 1882 Wilson, Dr Alex., Ashville, Mid-Calder
 1878 Wilson, John, of Alderston, Mid-Calder
 1870 Wilson, Peter, 3 Alfred Pl., Canonmills
 1858 Wilson, Richard, C.A., 28 Great King St.
 1877 Wishart, D. F., 18 Picardy Place
 1850 Wright, David, Ravenswood, South Oswald Road
 1875 Wylie, Alexander, W.S., 54 Queen St.
 1890 Wylie, James, Royal Bank, Leven St., Edinburgh
 1854 Young, Hon. Lord, 28 Moray Place
 1888 Young, David, 377 High Street
 1876 Young, John, St Margarets, Wester Duddingston
 1889 Young, J. W., W.S., 22 Royal Circus
 1887 Younger, George, 15 Carlton Terrace
 1870 Younger, Henry J., Abbey Brewery
 1863 Younger, Robert, 15 Carlton Terrace

HADDINGTON.

- 1882 Ainslie, John, jun., Morham Mains, Haddington
 1878 Aitken, Mark, Traprain, Prestonkirk
 1877 Anderson, Col., of Bourhouse, Dunbar
 1859 Anderson, G. B., Meikle Pinkerton, Dunbar
 1873 Anderson, W. W., of Kingston, North Berwick
 1881 Andrew, H., Lennoxlove Acredales, Haddington
 1860 BAIRD, Sir David, of Newbyth, Bart., Prestonkirk
 1863 Balfour, Right Hon. A. J., of Whittinghame, M.P., Prestonkirk
 1888 Bayley, Isaac F., Halls, Dunbar
 1859 Binne, John, Birnieknowes, Cockburnspath
 1872 Brand, James, Dunbar
 1880 Bridges, Andrew, Engineer, North Berwick
 1868 Broadwood, T., Crowhill, Dunbar
 1848 Brodie, Jas. C., Thorntonloch, Dunbar
 1889 Bruce, John, Newlands, Haddington
 1884 Calder, Robt., Cairnunnies, Haddington
 1871 Campbell, George, Rhodes, North Berwick
 1884 Caverhill, A. M., Crichness, Duns
 1859 Clapperton, James, Garvald Mains, Prestonkirk
 1864 Clark, James, Kirklandhill, Dunbar
 1880 Clark, Thomas, Oldhaustocks Mains, Cockburnspath
 1874 Connacher, P. M., Markle, Prestonkirk
 1889 Connor, G. A., Craigiclaw, Longniddry
 1886 Courtney, Wm., Portobello Farm, Tranent
 1883 Darling, James, Priestlaw, Duns
 1887 Deans, John, East Fenton, Drem
 1877 DENMAN, Lord, Alderston, Haddington
 1872 Dewar, David, Murrays, Ormiston
 1877 Dodds, Samuel, Sommerfield, Haddington
 1877 Donald, Andrew, Longnewton, Gifford, Haddington
 1864 Drysdale, Henry, Begbie, Haddington
 1884 Durie, John, Tranent
 1884 Elcho, Lord, M.P., Gosford, Longniddry
 1881 Elder, Hugh, East Bearford, Haddington
 1890 Elder, James, Haddington
 1890 Elder, Thomas, Stevenson Mains, Haddington
 1882 Esson, Robert, Beltonford, Dunbar

Admitted

- 1875 Ewart, H., Tynninghame, Prestonkirk
 1857 Fletcher, J., of Salton, Tranent
 1849 Ford, Wm., Fenton Barns, Drem
 1877 Fyshe, Peter, Newtonlees, Dunbar
 1859 Gaukroger, G., Southfield, Longniddry
 1883 Gemmell, Wm., Greenydes, Macmerrie
 1889 Gillespie, William, Atheistaneoford, Drem
 1855 Gray, Wm., Brownrigg, North Berwick
 1882 Gray, W. W., of Nunraw, Prestonkirk
 1876 Greenshields, T. A., Windymains, Salton
 1875 Guild, Jas. Lyon, Abbey, North Berwick
 1857†HADDINGTON, The Earl of, Tynninghame, Prestonkirk
 1878 HALL, Sir Basil F., of Dunglass, Bart., Cockburnspath
 1872 Handyside, J. B., Fenton, Drem
 1862 Hay, Captain J. G. Baird, of Belton, Dunbar
 1837 HEPBURN, Sir T. B., of Sineaton, Bart., Prestonkirk
 1886 Hope, Harry, Oxwell Mains, Dunbar
 1865 Hope, Henry W., of Luftness, Drem
 1847 Hope, James, East Barns, Dunbar
 1878 Hope, William James, East Barns, Dunbar
 1877 Houston, M. H., of Beechhill, Haddington
 1840 Hume, P. H., Dunbar
 1887 Hunter, Richard, of Thurston, Dunbar
 1842 Innes, T. S. Mitchell, of Phantassie, Prestonkirk
 1877 Johnston, Alex., North Mains, Ormiston
 1873 King, William, jun., Wolfstar, Ormiston
 1859 KINLOCH, Sir Alexander, of Gilmerton, Bart., Drem
 1885 Kinloch, David A., yr. of Gilmerton, Guards' Club, London
 1878 Lawrie, Jas. D., of Monkkrigg, Haddington
 1889 Lowson, James Grey F., Beltonford, Dunbar
 1870 M'Culloch, D., Bank Agent, North Berwick
 1864 M'Ewen, J., Redside Farm, North Berwick
 1887 M'Nab, William, Northrigg, Haddington
 1877 Mark, John, Sunnyside, Prestonkirk
 1869 Melrose, Patrick, Whitelaw, Haddington
 1889 Murray, Rev. W. B., Morham Manse, Haddington
 1871 Nelson, Charles, Skateraw, Innerwick
 1865 Newton, Captain Hay, of Newton, Haddington
 1889 Ogilvy, H. T. N. Hamilton, Biel, Prestonkirk
 1866 Park, Thos. B., Springfield, Haddington
 1889 Park, Wm. R., of Blegbie, Upper Keith
 1865 Puntun, F. H., Aberlady Mains, Longniddry
 1863 Richardson, J., Hilton Cottage, Haddington
 1862 Riddell, Wm., Cocklaw, Haddington
 1873 Robertson, James F., Newhouse, Drem
 1872 Robertson, Robt., West Barns, Dunbar
 1874 Robson, John, Millknowe Cranshaws, Duns (Newton, Bellingham)
 1886 Scott, Alex., Summerfield, Dunbar
 1883 Scott, G. R., Commercial Bank, Dunbar
 1878 Sharp, John J., Ewingston, Gifford—
Free Life Member
 1847 Shirriff, David, Muirton, Drem
 1850 Shirriff, Samuel D., North Berwick
 1868 Smith, Andrew, Longniddry
 1853 Smith, Chas., Whittinghame, Prestonkirk
 1876 Smith, D. W. E., North Elphinstone, Tranent
 1882 Smith, E. Hedley, Whittinghame, Prestonkirk—*Free Life Member*

Admitted

- 1878 Smith, William, Greenhead, Pencaitland
 1855 Stodart, William, Wintonhill, Tranent
 1883 Stuart, A. C., of Eaglescairn, Haddington
 1862 Swinton, P. Burn, Holyn Bank, Gifford
 1853 Sydserff, T. Buchan, of Ruchlaw, Prestonkirk
 1855 Taylor, J. B., Seton West Mains, Prestonpans
 1859 Turnbull, P., Little Pinkerton, Dunbar
 1877 Turnbull, Walter, Tynemont, Ormiston
 1879 TWEEDDALE, The Marquis of, Yester, Haddington
 1859 Tweedie, Alexander, Coats, Haddington
 1881 Wallace, John, Hailes, Haddington
 1888 Watt, Miss Adelaide, of Spott, Dunbar
 1850 Welsh, Alexander, Waughton, Prestonkirk
 1847†WEMYSS and MARCH, The Earl of, Gosford, Longniddry
 1888 Wilson, Peter, Rhodes, North Berwick
 1885 Wylie, N. M., New Club, North Berwick
 1884 Wylie, Alex., Thurston Mains, Dunbar
 1877 Young, D. S., Bonnington, North Berwick
 1869 Yule, Edward, Balgone, North Berwick

LINLITHGOW.

- 1874 Allan, J., Corn Merchant, Bo'ness
 1875 Allan, James, jun., Bo'ness
 1879 Armour, J., Niddrie Mains, Winchburgh
 1855 Bartholomew, J., Craigton House, Winchburgh
 1883 Bartholomew, John, Duntarvie, Winchburgh
 1857 Bett, James, of Kaim Park, Bathgate
 1858 Borthwick, John, V.S., Kirkliston
 1855 Brash, James, Hallyards, Kirkliston
 1876 Brock, J. E., Overton, Kirkliston
 1885 Brownlee, George, Cousland, Bathgate
 1875 Brownlee, James, East Whitburn Farm
 1865 Bryce, James, East Whitburn, Whitburn
 1869 Cadzow, J., Bangour, Uphall
 1873 Chapman, James, Balencriff Mill, Bathgate
 1860 Davidson, George, Walton, Linlithgow
 1881 Drysdale, And. L., The Leuchold, Dalmeny Park, Edinburgh
 1870 Dudgeon, Alex., Humble, Kirkliston
 1869 Dudgeon, George, Almondhill, Kirkliston
 1887 Dudgeon, Jn. G., Easter Dalmeny, Dalmeny
 1889 Ferrier, Wm. C., Birkenshaw, Bathgate
 1868 Fleming, George, Haugh, Kirkliston
 1875 Fletcher, John, Dolphington, Cramond Bridge
 1855 Gardner, Robert, Whitburn
 1869 Glendinning, Alex., New Mains, Kirkliston
 1873 Glendinning, G. P., Dalmeny Park, Edinburgh
 1848 Glendinning, P., South Queensferry
 1876 Graham, William, Wheatlands, Cramond Bridge
 1867 Grieve, D., Blackberry Hill, Whitburn
 1878 Hare, Lt.-Col., of Calder Hall
 1850 Hill, John, Carlowie, Cramond Bridge
 1860 Hog, Thos. A., of Newliston, Kirkliston
 1887 Hope, Capt. Thos., of Bridge Castle, Bathgate
 1884†HOPETOUN, The Earl of, Hopetoun House, South Queensferry
 1856 Johnston, John, Banker, Bathgate
 1868 Law, James, East Mains, Broxburn
 1880 Learmonth, G. Gray, North Bank Bo'ness
 1863 Lesslie, James, Boghall, Linlithgow
 1869 M'Kinlay, John, Hardhill, Bathgate

Admitted

- 1847 M'Lagan, Peter, of Pumpherston, M.P.,
Calder Hall, Mid-Calder
1883 MacNab, John, Glenmavis, Bathgate
1879 Masson, Rev. Alex., The Manse, Kirk-
liston
1867 Meikle, John, Grougfoot, Linlithgow
1879 Meikle, William, East Bonhard, Lin-
lithgow
1886 Melville, G. F., Sheriff-Substitute, Lin-
lithgow
1877 Mitchell, Geo., Broxburn Park, Broxburn
1887 Mitchell, Pet. B., Kinneil Estate, Bo'ness
1886 Mitchell, Wm., Dechnont, Uphall
1859 Morrison, J., West Dalmeny, Dalmeny
1888 Nimmo, Thos., Kirklands, Wynchburgh
1873 Orr, James, Hill, Whitburn

Admitted

- 1868†ROSEBERRY, The Earl of, Dalmeny Park,
Edinburgh
1889 Rough, Robert L. (R. Rough & Sons),
Broxburn
1882 Russel, James, Dundas Castle, Queens-
ferry
1886 Russell, Alex., of Mosside, Bathgate
1889 Russell, Thomas, Greenhill, Avonbridge
1877 Shields, James, Byers, Bathgate
1887 Shields, John, Auctioneer, Linlithgow
1864 Steuart, Captain R., of Westwood, West
Calder
1881 Stewart, G. M. F., of Binny, Linlithgow
1888 Tod, Wm., Pardovan, Philipstoun, Lin-
lithgowshire
1889 Walker, Thos. Geo., Kilpunt, Broxburn

5.—ABERDEEN DISTRICT.

EMBRACING THE

COUNTIES OF ABERDEEN, BANFF, FORFAR (EASTERN
DIVISION), AND KINCARDINE.

ABERDEEN.

Admitted
 1872 HER MOST GRACIOUS MAJESTY THE
 QUEEN
 1873*HIS ROYAL HIGHNESS THE PRINCE OF
 WALES
 1868†ABERDEEN, The Earl of, Haddo House,
 Methlick
 1885 Abernethy, David W., Ferryhill Foundry,
 Aberdeen
 1884 Adani, Alexander, 20 Union Terrace,
 Aberdeen
 1876 Adam, Thos., National Bank, Aberdeen
 1890 Adam, Walter, Corskellie, Huntly
 1876 Ainslie, Ainslie Douglas, of Delgaty
 Castle, Turriff
 1875 Ainslie, Wm., Pitfour, Mintlaw
 1876 Alexander, Geo., South Balnoon, Huntly
 1889 Allan, John, Aikenshill, Culter Cullen,
 Aberdeen
 1885 Anderson, George, West Fingask, Old
 Meldrum
 1857 Anderson, John, Craigton, Banchory
 1868 Anderson, John, Mill of Wester Coull,
 Tarland
 1876 Anderson, John M., Huntly
 1881 Anderson, Robt., Wester Coull, Tarland
 1876 Anderson, William, Wardes, Kintore
 1876 Anderson, Wm., Wellhouse, Alford
 1885 Angus, Samuel, Bonnymuir, Aberdeen
 1882 Argo, James, Cairdseat, Udney, Aberdeen
 1885 Bain, George, Old Mill Reformatory,
 Aberdeen
 1888 Baird, Geo. Alex., of Strichen and Stit-
 chell
 1858 Barclay, C. A., Aberdour House, Fraser-
 burgh
 1862 Barclay, J. W., M.P., 60 Dee Street,
 Aberdeen
 1885 Barclay, Morrison, 60 Dee Street, Aber-
 deen
 1884 Barron, Geo. F., Melkile Endovie, Alford,
 N.B.
 1888 Baxter, Andrew, Lime Co., Aberdeen
 1876 Bean, Alex., Sunnyside, Rothienorman
 1876 Bean, George, Balquhain, Inverurie
 1885 Bean, James, Mains of Dumbreck, Udney
 1882 Beaton, Jas., Burnside of Delgaty, Turriff
 1885 Beaton, John, Station Hotel, Inch
 1882 Beattie, James A., C.E., Aberdeen
 1876 Beedie, James, The Mains, Ardlaw,
 Fraserburgh
 1876 Bell, John, Tyrie Mains, Fraserburgh
 1888 Bennet, L., Crookednook, Longside
 1868 Benton, William, Harthill, Whitehouse
 1886 Black, James, Barthol Chapel, Old
 Meldrum
 1884 Bothwell, Wm., Berryhill, Bridge of Don,
 Aberdeen
 1879 Bowman, James, Square, Huntly

Admitted
 1876 Brehmer, Alexander, Balquhindochy,
 Methlick
 1886 Brown, James H., Banker, Ellon
 1884 Brown, John, Craigie Cottage, Hardgate,
 Aberdeen
 1883 Brown, Joseph, Little Endovie, Alford
 1864 Bruce, Geo., Pennan Farm, Fraserburgh
 1868 Bruce, George, Heatherwick, Keith Hall
 1874 Bruce, G., 35 Market Street, Aberdeen
 1876 Bruce, James, Collithie, Gartly
 1868 Bruce, James, Inverquhomery, Mintlaw
 1876 Bruce, Peter, Myreton, Inch, Aberdeen
 1875 Burr, Alexander, Tulloford, Old Meldrum
 1877 Burr, John M., Netherton, Fyvie, Aber-
 deen
 1868 Campbell, Alex., Belmont, Aberdeen
 1876 Campbell, Silvester, Toftulls, Aberdeen
 1888 Chapman, Alex., Bonnytownhill, Fraser-
 burgh
 1873 Charles, John, Town and County Bank,
 Inverurie
 1869 CLARK, Sir John F., of Tillypronie, Bart.,
 Tarland
 1873 Clarke, William, Hopewell, Tarland
 1858 Cochran, James, Waterside Lodge, New-
 burgh
 1886 Collie, Wm., Priestwells, Inch
 1871 Cook, Charles, Cardan House, Aber-
 deen
 1876 Copland, Alex., Commercial Co., Aber-
 deen
 1840 Cordner, W. F., Mormond House, Cortes
 1869 Coupur, J. C., of Craigiebuckler, Aber-
 deen
 1868 Cowie, Alex., jun., Turtory, Huntly
 1884 Cowie, Alex., Ellon
 1887 Crabb, Dd., New Aberdour, Fraserburgh
 1875 Craig, William, Old Meldrum
 1878 Cran, George, Old Morlich, Inverkindie
 1876 Cran, James, jun., Knockandoch, White-
 house
 1858 Cruickshank, Amos, Sittyton, Aberdeen
 1868 Cruickshank, Andrew, 37 Gordon Street,
 Huntly
 1876 Cruickshank, J., Ladysford, Fraserburgh
 1876 Cruickshank, J. W., Elrick House, Sum-
 nerhill, Aberdeen
 1876 Dakers, James, 24 Union Row, Aberdeen
 1886 Darling, D. C., 11 Bridge St., Aberdeen
 1886 Dawson, W. F. G., North of Scotland
 Bank, Inch
 1882 Dewar, Alexander, Bethlin, Midmar,
 Aberdeen
 1883 Dewar, J. R. U., V.S., Flour Mill Brae,
 Aberdeen
 1858 Donald, James, Whitemyres House, Old
 Skene Road, Aberdeen
 1868 Duff, Col. James, Knockleith, Turriff
 1884 Duff, G. A., of Hatton, Turriff
 1858 Duguid, P., of Cammachmore, Aberdeen

Admitted

- 1886 Duncan, Alexander, Bridge of Dee, Aberdeen
 1877 Duncan, John, Fortrie, King Edward
 1877 Duncan, Patrick, Balchers, King Edward
 1879 Durno, James, Jackston, Rothienorman
 1868 Durno, John, Lambhill, Inch
 1885 Durno, Leslie, Mains of Glack, Old Meldrum
 1880 Durward, Jn., Luib, Corgarff, Strathdon
 1891 Durward, Robert, Blielack, Coldstone, Dinnet
 1868 Duthie, William, Banker, Tarves
 1877 Edmond, Alex., yr. of Kingswells, Garthdee, Aberdeen
 1866 Farquharson, J., 1 Abbotsford Place, Aberdeen
 1872 Ferguson, Lieut.-Col. George A., of Pitfour, Minto
 1885 Ferguson, Geo. A., Lessendrum, Drumblude
 1868 Ferguson, Thomas, 46 Don Street, Old Aberdeen
 1870 Ferguson, William, of Kinnmudy, Aberdeen (41 Manor Place, Edinburgh)
 1865 Foggo, R. G., Invercauld Office, Ballater
 1872 Forbes, Right Hon. Lord, Castle Forbes, Keig
 1862 Forbes, The Hon. J. O., of Corse, Lumphinan
 1874 Forbes, James, Tombreck, Glenbucket
 1842 Forbes, General Sir John, of Invernan, K.C.B., Strathdon
 1885 Forbes, William, Ruthven, Dinnet
 1874 Fowler, William, of Aslead, Methlick
 1885 Fowlie, James, Brucehill, New Deer
 1872 France, C. S., 11 Bridge Street, Aberdeen
 1869 Fraser, Col. Fred. Mackenzie, of Castle Fraser, Aberdeen
 1885 Fraser, Geo., Hill of Skillmailly, Ellon
 1874 Garden, Robert, North Ythsie, Tarves
 1882 Garioch, Peter, 1 Stirling St., Aberdeen
 1882 Garvie, R. G. (Ben. Reid & Co.), Aberdeen
 1886 Geddes, Alex., of Blairmore, Glass, Huntly
 1876 Gibson, H. J., Fornety, Foveran, Aberdeen
 1885 Gordon, Alex., of Pitlurg and Dyce, Parkhill House, Aberdeen
 1876 Gordon, A. M., of Newton, Inch
 1875 Gordon, A. N. Forbes, of Rayne, Corse House, Lumphinan
 1873 Gordon, C. P., of Wardhouse, Inch
 1876 Gordon, Henry, of Manar, Inverurie
 1886 Gordon, Henry G. Fellowes, of Knockespoock, Clatt
 1868 Gordon, H. W., of Hallhead, Ellon
 1889 Gordon, Robert, Gordonston, Clatt, Kennethmont—*Free Life Member*
 1876 Gordon, William, Auchallater, Baemar
 1889 GRANT, Sir Arthur, of Monymusk, Bart.
 1876 Grant, John, Banker, Methlick
 1841 Grant, Robert, of Druminnor, Rhynie
 1829 Grassick, John, 21 Ferryhill Place, Aberdeen
 1890 Hadden, Gavin, Dalmuinzie, Murtle
 1864 Halkett, Jas., Auchentender, Inch
 1876 Hall, Alex. H., Campfield, Banchory
 1885 Harper, Hugh (Harper & Co.), Aberdeen
 1876 Harvey, G. T., 63 Union Street, Aberdeen
 1854 Harvey, J. H., Pitgersie, Foveran, Ellon
 1885 Hay, Alexander (Ben. Reid & Co.), Aberdeen
 1862 Hay, Col. A. S. L., of Rannes, C.B., Kennethmont
 1858 Hay, James, jun., Little Ythsie, Tarves
 1887 Hay, John, of Millmoss, Turriff
 1884 Hepburn, James, Spital, Keithhall, Whiterashes, Aberdeen

Admitted

- 1876 Hunter, Capt. A. C., of Tillery and Auchries, Aberdeen
 1884 Hunter, Charles, Upper Mills of Drum, Crathes
 1872 HUNTER, The Marquis of, Aboyne Castle, Aboyne
 1884 Hutcheon, Alex., Nether Ordley, Auchterless, Turriff
 1886 Hutcheon, Major John, Lower Cotburn, Turriff
 1887 Hutcheon, John, of Upperton, Gask House, Turriff
 1890 Innes, Lt.-Colonel Francis Newel, R.N., R.A., yr. of Learney, Torphins
 1846 Innes, Col. Thos., of Learney, Aberdeen
 1862 Innes, T. G. Rose, of Netherdale, Turriff
 1859 Ironside, William, Clofrickford, Ellon
 1845 Irvine, Alex. Forbes, of Drum, Aberdeen
 1876 Jamieson, G., 34 Nether Kirkgate, Aberdeen
 1876 Jeffrey, Arthur, Tillyfour, Whitehouse
 1876 Johnstone, J., Drumwhindle Mains, Ellon
 1887 Kellas, James, Nether Comisty, Huntly
 1876 Keith, Alexander, Chapelton, Ellon
 1876 Kilgour, Robert, jun., Ardin, Ellon
 1876 Law, Jn., New Keig, Whitehouse, Aberdeen
 1885 Law, John, Lochend, Old Meldrum
 1871 Lawson, Charles, Deebank, Cults
 1868 Lawson, C., Ordhead, Cluny, Aberdeen
 1881 Leask, William, Skillmailly, Ellon
 1876 Ledingham, A., Balnoon Cottage, Forgue, Huntly
 1885 Ledingham, John, Fintry, Turriff
 1889 Ledingham, J. K., Slap, Turriff—*Free Life Member*
 1890 Leith, A. J. Forbes, of Fyvie Castle, Fyvie
 1869 Leith, Major Thomas, Petmathen, Oyne
 1885 Leslie, David, Lochhills, New Machar
 1885 Leslie, G. Arbuthnott, of Warthill, Aberdeen
 1884 Leys, James, Asloun, Alford
 1857 Lovie, Alex., Nether Boydnie, Fraserburgh
 1877 LUMSDEN, Gen. Sir H. B., Belhelvie Lodge, Aberdeen
 1869 Lumsden, Henry, of Pitcaple, Pitcaple
 1877 Lumsden, H. G., of Auchindoir, Aberdeen
 1876 Lumsden, W. H., of Balmedie, Aberdeen
 1884 Lyon, John, Peterwell, Fyvie
 1858 M'Combie, Robt., Upper Farnton, Whitehouse, Aberdeen
 1858 M'Connach, Chas., Cairnballoch, Alford
 1868 Macdonald, R., Cluny Castle, Aberdeen
 1884 M'Intosh, Jas., 50 Market Buildings, Aberdeen
 1880 MACKENZIE, Sir A. R., of Glenmuick, Bart., Braiklie House, Ballater
 1869 Mackie, James, Lewes, Fyvie
 1871 Mackie, William, Petty, Fyvie
 1869 Mackinnon, L., jun., Advocate, Aberdeen
 1889 Macpherson, And., Gibston, Huntly
 1883 M'Robie, Alex., Sunnyside, Aberdeen
 1876 M'William, Mrs. Aberdeen
 1858 Maitland, James, jun., Little Methlick, Methlick
 1884 Maitland, John, Easter Balhalgardy, Inverurie
 1875 Maitland, Robt., Balhalgardy, Inverurie
 1876 Marr, John, Cairnbrogie, Old Meldrum
 1855 Marr, Wm. Smith, Upper Mill, Tarves
 1883 Marr, W. S., jun., Upper Mill, Tarves
 1885 Matthews, Jas., 255 Union Street, Aberdeen
 1875 Mearns, Rev. Duncan G., Oyne Manse, Aberdeenshire
 1875 Merson, James, Craigwillie, Huntly

Admitted

- 1876 Middleton, Alex., Belmont, Aberdeen
 1855 Milne, Alex., Victoria Cottage, Dyce
 1891 Milne, James, Gateside, Old Meldrum
 1856 Milne, J., Netherton of Pittendrum, Fraserburgh
 1867 Milne, John, Inverurie—*Free Life Member*, 1873
 1887 Milne, Robt., Corse of Kinnoir, Huntly
 1876 Mitchell, Alex., Balgreen, King Edward
 1885 Mitchell, James, Caies Mill, Kinaldie
 1876 Mitchell, Wm., Mains of Biffie, Old Deer
 1868 Mitchell, Wm. A., Auchnagathel, Keig
 1881 Moffat, Wm., Great N. of S. Railway, Aberdeen
 1886 Moir, Alexander, Woodside, Aberdeen
 1885 Moir, Robert, Tarty, Ellon
 1871 Morris, W., V.S., 7 Langstane Place, Aberdeen
 1885 Morrison, Andrew, Upper Cotburn, Turriff
 1876 Morrison, John, jun., Hattonslap, Methlick
 1885 Morrison, John, Knockiemill, Turriff
 1872 Muirhead, George, Haddo House Mains, Aberdeen
 1879 Murray, James, Fauchfaulds, Turriff
 1872 Nares, A. F., Parkhill, Aberdeen
 1869 Nicol, W. E., of Ballogie, Aboyne
 1885 Nicol, Wm., Ordhead, Cluny, Aberdeen
 1882 Norrie, Wm., Cairnhill, Monquhitter, Turriff—*Free Life Member*
 1882 Ogston, Alex. M., of Ardoe, Aberdeen
 1855 Paul, William, Advocate, Aberdeen
 1882 Paull, James, Advocate, Aberdeen
 1856 Philip, George, Boynds, Keith Hall, Inverurie
 1850 Pittendrich, A., Mains of Park, Lonmay
 1868 Profeit, Dr, Craigowan Cottage, Balmoral
 1882 Rae, John, jun., Corn Merchant, Ellon
 1882 Rae, Wm., Advocate, Aberdeen
 1856 Ramsay, Col. John, of Barra, Straloch, Aberdeen
 1891 Reid, David, Crofts of Glenmuick, Ballater
 1877 Reid, Dr James, Templeton, Mossat
 1858 Reid, James, Greystone, Alford
 1876 Reid, James, Horse Bazaar, Peterhead
 1884 Reid, John, Balquharn, Alford, N.B.
 1884 Reid, W. R., 137 Union Street, Aberdeen
 1885 Reid, Wm., 8 Haddon Street, Aberdeen
 1876 Reith, Robert, Middlefield, Woodside, Aberdeen
 1885 Robson, Alex. (W. Smith & Sons), Aberdeen
 1885 Ronald, James, Pithee, Pitcaple
 1885 Ross, Alex., Nether Park, Drumoak
 1858 Ross, H., care of the Secretary, Mutual Improvement Association, Tarland
 1843 Ross, John Leith, of Arnage, Ellon
 1871 Ross, Peter, Arngrove, Torphins
 1871 Ross, Wm., Annesley, Torphins
 1885 Runciman, James, Castleton, King Edward
 1885 Runciman, John, Auchmull, King Edward
 1854 Ruxton, Andrew, South Artrochie, Ellon
 1868 Salmon, R., 269 Great Western Road, Aberdeen
 1886 SALTOON, Right Hon. Lord, Philorth House, Fraserburgh
 1881 Scott, Ronald, 286 Great Western Road, Aberdeen
 1857 Scott, W., Urquhart Road, Old Meldrum
 1885 Sellar, R. H. N., Implement Maker, Huntly
 1857 SEMPILL, Right Hon. Lord, Fintray House, Aberdeen
 1868 Shaw, James, Tillyching, Lumphanan

Admitted

- 1865 Shepherd, George, Shethin, Tarves
 1866 Sim, Alex., 1 Market Street, Aberdeen
 1885 Simpson, John, Implement Maker, Peterhead
 1856 Skinner, James, Woodside, Aberdeen
 1889 Skirving, Robert, of Cobairdy, Huntly
 1858 Sleigh, John, Strichen Mains, Strichen
 1885 Smith, Arthur, Oakbank Cottage, Kingsgate, Aberdeen
 1885 Smith, James, Burnshangie, Strichen
 1885 Smith, J. S., Northern Agricultural Company, Aberdeen
 1858 Stephen, James, Conglass, Inverurie
 1889 Stewart, David, of Banchory, Banchory House, Aberdeen
 1857 Stewart, Samuel, 36 Osborne Place, Aberdeen
 1885 Still, Alexander W., Nether Anguston, Peterculter
 1885 Still, Geo., Strathray, Kinneller, Blackburn, Aberdeen
 1883 Strachan, Alex., Wester Fowlis, Alford
 1874 Strachan, Andrew, Saphock, Old Meldrum
 1878 Strachan, Charles, Tillyorn, Tarland
 1858 Strachan, Lewis, Cluny of Raemoir, Banchory
 1865 Stuart, Alexander, of Laithers, Turriff
 1855 Stuart, E. R. Burnett, of Dens and Crichtie, Mintlaw
 1876 Tait, John, Crichtie, Inverurie
 1876 Taylor, James, Toux, Mintlaw
 1878 Thompson, George, of Pitmedden, 40 Marischal Street, Aberdeen
 1875 Thomson, Wm., Banker, Tarland
 1877 Turnbull, Peter M., Smithston, Gartly
 1853 Turner, John, of Turner Hall, Ellon
 1873 Udney, J. H. F., of Udney and Dudwick, Aberdeen
 1864 Urquhart, B. C., of Meldrum, Old Meldrum
 1876 Urquhart, Major F. P., of Craigston, Turriff
 1888 Walker, Alex., Gunhill, Inverurie
 1884 Walker, David, Coullie, Udney
 1881 Walker, George, Port Elphinstone, Inverurie
 1877 Walker, James, West Side of Brux, Kildrumny, Aberdeen
 1858 Walker, Wm., Ardhuncart, Mossat
 1876 Watson, George, Edendack, Gartly
 1864 Watson, J. F., of Blackford, Rothie-norman
 1868 Watt, Gordon, Mains of Park, Drumoak
 1889 Watt, John, Newton of Mounie, Daviot, Old Meldrum
 1882 Whyte, John, Advocate, Aberdeen
 1873 Wilken, George, Waterside of Forbes, Alford
 1858 Williamson, A. F., Durno House, Pitcaple, Aberdeen
 1850 Williamson, George, 194 King Street, Aberdeen
 1884 Wilson, A. S., North Kinnmudy, Summerhill, Aberdeen
 1865 Wilson, John, Castle Park, Huntly
 1885 Wilson, Wm., Coynachie, Gartly
 1873 Wilson, Thomas, Solicitor, Aberdeen
 1868 Yeats, Alex., Advocate, Aberdeen
 1838 Yeats, William, of Aquharney, Beacons-hill, Aberdeen
 1868 Yull, John S., Little Ardo, Methlick

BANFF.

- 1873 ABERCROMBY, Sir R. J., of Birkenbog, Bart., Forglen, Turriff
 1882 Barclay, Wm., Gordon Arms Hotel, Keith

Admitted

- 1888 Batchen, Alex., Arndilly, Craigellachie
 1875 Campbell, James, Cullen House, Cullen
 1887 Cowie, Geo., jun., Pitglassie, Dufftown
 1883 Cran, John, Butcher, Keith
 1868 Cumming, George, Writer, Banff
 1889 Cumming, J. F., Cardow, Craigellachie
 1876 Dawson, William, Gordon Castle, Fochabers
 1885 Donaldson, George, Ladysbridge Asylum, Banff
 1858 Duff, L. Duff Gordon, of Drummuir, Keith
 1880 Duff, Thomas Gordon, Park House, Banff
 1888 Duncan, G. A., Foundry, Banff
 1868 Duncan, R., Auchinbaidie Mains, Banff
 1883 Duncan, Robert, Banff
 1884 Fife, The Duke of, K.T., Duff House, Banff
 1879 Findlater, James Smith, Balvenie, Dufftown
 1884 Gilchrist, James, Baker, Banff
 1881 Gordon, John P., of Caunfield, Fochabers
 1876 Gordon, P. G., Nevie, Glenlivet, Ballindalloch
 1886 Graham, William, Brewer, Banff
 1876 Grant, G. S., Auchorachan, Glenlivet, Ballindalloch
 1874 Green, Robert, Ruthrie, Aberlour
 1858 Hannay, John, Moncoffer, Banff
 1876 Inkson, Thomas F., Kinermory, Craigellachie
 1881 INNES, Sir J., of Balveny and Edingight, Bart., Keith
 1876 Kemp, Chas., Methercluny, Dufftown
 1883 Kemp, James, Lime Works, Keith
 1869 Kynoch, Geo., Isla Bank Mills, Keith
 1888 Leith, James, Glengerrack Mains, Keith
 1876 Leslie, A. F., Braco, Keith
 1885 Longmore, Leith E., Bettie, Banff
 1883 M'Donald, Alexander (M'Donald Bros.), Portsoy
 1885 M'Donald, Alexander, Kinbrough, For-dyce
 1884 MacGillivray, A. E., V.S., Banff
 1876 Macpherson, J., Mulben, Keith
 1887 Maitland, Harry Reid, Muirfold, Grange, Keith—*Free Life Member*
 1858 Maitland, William, Muirfold, Grange, Keith
 1880 Menzies, W. G. Steuart, Aikenway, Craigellachie
 1867 Michie, C. Y., Forester, Cullen House
 1874 Miller, John, Seafield, Cullen
 1886 Morison, Major F. D., of Mountblairy, Turriff
 1885 Morison, James O., yr. of Culvie, Aberchirder
 1858 Murray, William, Mains of Pittendreich, Turriff
 1873 Ogilvie, A. M., Tillynaught, Portsoy
 1873 Paterson, Wm., Auldtown of Carnoustie, Turriff
 1869 Ramsay, Alex., *Banffshire Journal* Office, Banff
 1884 Reid, Wm. T., of Ardmellie, Banffshire
 1840* RICHMOND and GORDON, The Duke of, K.G., Gordon Castle, Fochabers
 1857 Robertson, William, Port Gordon, Fochabers
 1858 Rust, James, Paddocklaw, Banff
 1868 Shand, Geo., Ordens, Boyndie, Banff
 1885 Simpson, Alexander, Duff House, Banff
 1876 Simpson, J. (Auchinachie & Simpson), Keith
 1874 Skinner, Wm. M., Drumin, Ballindalloch
 1883 Smith, Alex., Inchcoarse, Rothiemay
 1852 Smith, J. Gordon, Minnmore, Ballindalloch

Admitted

- 1869 Smith, J., Mullochard, Ballindalloch
 1845 Steuart, And., of Auchlunkart, Keith
 1887 Stuart, A. R., of Inverfiddich, Craigellachie
 1873 Stuart, C., Tomindugle, Knockando, Craigellachie
 1876 Turner, R., Auchnarrow, Ballindalloch
 1883 Turner, Robert, Cairnton of Boyndie, Portsoy
 1857 Walker, Francis, Craignetherty, Turriff
 1884 Watt, Geo. Neish, Gellyhill, Banff
 1876 Wilson, George, Marypark, Ballindalloch
 1885 Wilson, James, Inchgower, Fochabers

FORFAR

(EASTERN DIVISION).

- 1880 Adam, John, Bolshan, Arbroath
 1884 Allison, Wm., Clearbank, Stracathro, Brechin
 1884 Anderson, D., Woodhill, Carnoustie
 1884 Anderson, James, jun., Mains of Parkhill, Arbroath
 1863 Anderson, Jas., Westside, Brechin
 1890 Arnot, David, Mains of Edzell, Brechin
 1890 Bell, James, Gilchorn, Arbroath
 1890 Bell, Thomas, M.R.C.V.S., Muirdrum, Carnoustie
 1849 Campbell, J. A., of Stracathro, M.P., Brechin
 1887 Campbell, Jas. Morton Peto, yr. of Stracathro, Brechin
 1886 Carnegie, Alex., of Redhall, Forebank House, Brechin
 1869 Carnegie, H. L., of Kinblethmont, Arbroath
 1858 Carnegie, W., of Dunlappie, Brechin
 1887 Chalmers, P., Aldbar Castle, Brechin
 1890 Collier, John W., Hatton, Carnoustie
 1879 Colquhoun, Dug., Vitriol Works, Carnoustie
 1859 Compar, John, Balrownie, Brechin
 1870 Cowe, George, Balhousie, Carnoustie
 1855 Croll, John, Orchard Park, Broughty Ferry
 1858 Dickson, James A., Woodville, Arbroath
 1858 Dickson, J. F., Panbride House, Carnoustie
 1869 Duncan, Jas., Panlathie Mill, Carnoustie
 1862 Erskine, J. E., of Lunlathen, Broughty Ferry
 1884 Fairweather, John, Chapletown, Brechin
 1885 Finlayson, James, Balcathie, Arbroath
 1890 Fleming, Alexander, Charleton, Montrose
 1891 Fleming, James, Friock Mains, Friockheim
 1890 Fletcher, Chas. Fitzroy, of Letham Grange, Arbroath
 1890 Gairlyne, James W. Bruce, Middleton House, Friockheim
 1882 Guthrie, C. M. L., yr. of Carnoustie, Dundee
 1880 Hume, David, Barrelwell, Brechin
 1858 Jamieson, D., Auchnuthie Mains, Arbroath
 1890 Kydd, James, Seryne, Carnoustie
 1858 Laird, Geo. W., of Denfield, Arbroath
 1890 Lamb, David, Fithie, Farnell, Brechin
 1854 Lyall, David, of Gallery, Montrose
 1890 Lyall, Robert J., Powis, Montrose
 1881 M'Corquodale, David, Banker, Carnoustie
 1889 Miller, James, Balgillo, Broughty Ferry
 1889 Miln, George, Solicitor, Arbroath
 1881 Milne, John, Corn Merchant, Montrose
 1884 Mitchell, Charles, Kintrockat, Brechin
 1879 Mitchell, James, Merchant, Montrose

Admitted

- 1862 Mitchell, Wm., Merchant, Montrose
 1881 Mitchell, Wm., Ledmore, Menmuir, Brechin
 1868 Morgan, D., South Mains of Ethie, Arbroath
 1890 Nicoll, G. F., Chapelton of Leysmill, Arbroath
 1884 Nicoll, Wm., Hilton of Fearn, Brechin
 1890 Ogilvie, James Swan, Brackenbrae, Broughty Ferry
 1890 Ouchterlony, Lt.-Col. T. H., The Guynd, Arbroath
 1885 Pattullo, Jas., Abertay, Broughty Ferry
 1891 Pattullo, John, Hatton Mill, Frioekheim
 1884 Petrie, David D., Frioekheim, Arbroath
 1891 Ramsay, Hon. Charles Maule, Brechin Castle, Brechin
 1882 Robertson, James, Panmure, Carnoustie
 1884 Rodger, Geo., West Mains of Ethie, Arbroath
 1882 Rodger, Robt., jun., Mains of Dun, Montrose
 1866 Scott, D. G. C., Maisondieu, Brechin
 1883 Scott, William, Pitforthie, Brechin
 1883 Shepherd, John, Lundie, Brechin
 1883 Shield, J. T., Redcastle, Arbroath
 1885 Shiell, John, Solicitor, Brechin
 1866 Smith, Wm., West Drums, Brechin
 1889 Smyth, Chas. Armstrong, Duninald, Montrose
 1884 Soutar, D., East Mains of Keithock, Brechin
 1890 Souter, John, Auchrennie, Muirdrum, Carnoustie
 1850† SOUTHERSK, The Earl of, K.T., Kinnaird Castle, Brechin
 1880 Stansfeld, Capt. John, Dunninald, Montrose
 1869 Swan, James, Inverpeffer, Carnoustie
 1871 Swan, W., Ballhargie, Monifieth
 1861 Taylor, John, Redcastle, Arbroath
 1890 Taylor, Robt., Pitliviie, Carslougie House, Carnoustie
 1881 Tennant, James, Carlogie Road, Carnoustie
 1878 Thomson, Alex. M., Arbroath
 1876 Valentine, George, 55 Southesk Street, Brechin
 1874 Wood, Chris., Kintrockat House, Brechin
 1884 Young, George, Panlathie, Carnoustie

KINCARDINE.

- 1876 Adam, William, Bush, Banchory-Ternan
 1857 Anderson, Wm., Hattonburn, Banchory
 1833 ARBUTHNOTT, Right Hon. Viscount, Arbuthnot House, Fordoun
 1873 ARBUTHNOTT, Hon. The Master of, Arbuthnot House, Fordoun
 1881 Baird, Alex., of Urie, Stonehaven
 1873 Brown, W., Pitnamoon, Laurencekirk
 1858 BURNETT, Sir R., of Leys, Bart., Crathes Castle, Banchory
 1858 Calder, R., Raemoir, Banchory-Ternan
 1871 CLINTON, Right Hon. Lord, Fettercairn House, Fettercairn

Admitted

- 1884 Cooper, John, Ley, Banchory-Ternan
 1873 Craighead, James, Sillyflat, Bervie
 1858 Crombie, Alex., Thornton Castle, Laurencekirk
 1864 Davidson, J., Harestone, Banchory
 1876 Dickson, Patrick, Laurencekirk
 1866 Duff, Robert W., of Fettercasso, M.P., Stonehaven
 1858 Durie, David, Nether Mill, Fettercairn
 1873 Falconer, Wm., Cairnton, Fordoun
 1858 Farrell, A. H. W., Davo House, Fordoun
 1873 Fortescue, Archer, of Kingcausie, Aberdeen
 1891 Gammell, Sydney James, yr. of Drumtochty, Fordoun
 1876 GLADSTONE, Sir J. R., of Fasque, Bart., Fettercairn
 1869 Grant, Capt. Frederick G. Forsyth, of Ecclesgreig, Montrose
 1873 Greig, James Booth, Laurencekirk
 1884 Groig, William, Ashentilly, Durris, Aberdeen
 1884 Hart, John, Cowie House, Stonehaven
 1878 Hay, J. T., of Blackhall Castle, Banchory
 1884 Hunter, George, Kirktown of Banchory, Banchory-Ternan
 1888 Innes, Major W. D., of Cowie, Stonehaven
 1873 Kinnear, Arthur W., Stonehaven
 1876 Kinross, J., Coldstream, Laurencekirk
 1876 KINTROSE, Right Hon. The Earl of, Inghismaldie, Laurencekirk
 1876 Littlejohn, William, Easter Tulloch, Stonehaven
 1827 M'Inroy, Lieut.-Col. W., of The Burn, Brechin
 1885 Martin, James, The Grange, Bervie
 1885 Murray, J. J., Factor, Fasque, Fettercairn
 1857 Nicholson, J. Badenach, of Glenbervie, Fordoun
 1863 Pearson, David A., Johnston Lodge, Laurencekirk
 1885 Philip, Forbes, Tullos Home Farm, Nigg, Aberdeen
 1878 Porteous, D. S., of Lauriston, Montrose
 1874 Reddie, Capt., of Redhouse, Rickarton House, Stonehaven
 1859 Scott, Hercules, of Brotherton, Johnshaven
 1882 Shand, T. L. R., of Fawlsyde, Bervie
 1863 Sinclair, D., of North Lorrston, Aberdeen
 1876 Skeen, Geo., Meikle Fiddes, Drumlithie
 1873 Smith, James, Pittengardner, Fordoun
 1873 Smith, John, Balmaln, Fettercairn
 1868 Smith, W., New Mains of Urie, Stonehaven
 1868 Smith, W., of Benholm, Johnshaven
 1886 Strachan, George, Caunterland, Montrose
 1858 Taylor, Geo., of Kirktonhill, Montrose
 1857 Taylor, Robert, Drumfrenny, Banchory
 1868 Thomson, James, Balbegno, Fettercairn
 1888 Thomson, W. J. Sandford, Balmanno, Marykirk
 1888 TREFUSIS, Hon. Chas. S. Forbes, Fettercairn House, Fettercairn
 1863† Walker, G. J., Mains, Portlethen, Aberdeen

6.—DUMFRIES DISTRICT.

EMBRACING THE

COUNTIES OF DUMFRIES, KIRKCUDBRIGHT, AND WIGTOWN.

DUMFRIES.

Admitted

- 1879 Aitken, John M., Norwood, Lockerbie—
Free Life Member
1883 Allan, Wm., Drumlanrig Mains, Thornhill
1884 Armstrong, John S., Acrehead, Dumfries
1887 Anstin, James J. M., of Dalmakerran, Tynron
1880 Austin, William, Bank Agent, Thornhill
1888 Baird, Alex., West Mains, Collin, Dumfries
1870 Baird, John, Hall, Kirkconnel, Sanquhar
1871 Baird, John, Broomhouses, Lockerbie
1873 Baird, Thomas, Courance, Lockerbie
1854 Beattie, James, Newbie House, Annan
1870 Beattie, John, Bulmanskuowe, Canonbie
1878 Beattie, William J. P., Newbie, Annan
1868 Bell, Alexander, Stobahill, Lockerbie
1866 Bell, George, Minsea, Lockerbie
1863 Bell, James, Woodslee, Canonbie
1878 Bell, William, Todholes, Annan
1889 Blacklock, John, Solicitor, Dumfries
1878 Boothby, R. C., Heathery Haugh, Moffat
1878 Borland, John, Auchencairn, Closeburn, Thornhill
1859 Borthwick, J. J. M., Billholm, Langholm
1878 Broatch, George, Thwait, Ruthwell
1879 Brook, Edward, Hoddam Castle, Ecclefechan
1878 Brown, David, Ellerslie, Kirkmahoe
1860 Brown, James, Hardgrave, Ruthwell, R.S.O.
1886 Brown, James, Burnside, Holywood, Dumfries
1860 Brown, John C., Between-the-Waters, Ecclefechan
1884 Brown, Thomas, Guillyhill, Holywood, Dumfries
1877 Brown, T. M., Closeburn Castle, Thornhill
1884 Brown, Wm., Carterton, Lockerbie
1845 Carlyle, T. J., of Templehill, Waterbeck, Ecclefechan
1886 Carmont, James, British Linen Company Bank, Dumfries
1854 Carruthers, John, of Miln, Wamphray, Moffat
1870 Carruthers, John, Tundergarth, Lockerbie
1876 Carruthers, Joseph, Annan Bank, Moffat
1882 Carruthers, Joseph, Banker, Moffat
1870 Carruthers, R. B., Huntingdon Lodge, Dumfries
1876 Caven, Thos., Birkshaw, Glencairn, Dunscore
1876 Chariton, Jn., Corn Merchant, Dumfries
1878 Chrystal, Wm., Glichristland, Thornhill
1888 Church, J., Parkhouse, Canonbie
1878 Connell, J. W. F., of Auchencheyne, Thornhill

Admitted

- 1878 Cormack, John F., Solicitor, Lockerbie
1877 Crabbie, John, of Duncow, Dumfries
1886 Craig, Alex., Hunter's Lodge, Thornhill
1859 Craig, Wm., Laurel Bank, Dumfries
1872 Cranston, James, Tinwald House, Dumfries
1881 Crawford, Jas., Brydekirk Mains, Annan
1870 Critchley, J. A., Stapleton Tower, Annan
1878 Dalziel, Adam, Chanlockfoot, Penpont
1869 Dalziel, Jas., Victoria Terrace, Dumfries
1878 Dalziel, Robert, Drumhall, Penpont
1884 Dickson, George, Braehead, Collin, Dumfries
1862 Dickson, John H., Dabton, Thornhill
1860 Dickson, T., Drumcrulton, Thornhill
1886 Dobie, Alexander, Hitchell, Annan
1878 Dobie, David, Banker, Lockerbie
1885 Donaldson, Rev. Jn., Kirkconnel Manse, Sanquhar
1868 Douglas, A. H. Johnstone, of Lockerbie, Comlongan Castle, Ruthwell, R.S.O.
1884 Edmondson, James H., of Riddingwood, Amisfield, Dumfries
1874 Erskine, Henry, Buccleuch Square, Langholm—*Free Life Member*
1860 Farish, Samuel, Kirkland, Lockerbie
1877 Farish, Samuel T., Kirkland, Lockerbie
1877 Farish, William R., Tinwald Parks, Dumfries
1870 Ferguson, Jn., Seed Merchant, Sanquhar
1878 Fergusson, Ninian, Sanquhar
1878 Fleming, Gavin, Crowdie Knowe, Ecclefechan
1882 Gillespie, Denholm, 6 Marchbank Terrace, Dumfries
1873 Gillespie, Rev. John, Mouswald Manse, Ruthwell, R.S.O.
1860 Gordon, Henry, Moatbrae, Dumfries
1884 Graham, Major-General John Gordon, of Wyseby, Ecclefechan
1852 Graham, John, of Shaw, Lockerbie
1885 Graham, J. H. S., of Dunnabie, Ecclefechan
1859 Gray, Alex., Tanlawhill, Langholm
1880 GRIERSON, Sir A. D., of Lagg, Bart., Dumfries
1872 Grieve, Archd., Albierigg, Canonbie
1880 Harkness, W. I., Mitchellsacks, Thornhill
1860 Henderson, James, Kelloside, Sanquhar
1887 Henderson, John, Solicitor, Dumfries
1862 Hewetson, J., Auchembainzie, Thornhill
1870 Hiddleston, John, Kirkland, Closeburn, Thornhill
1884 Howat, John, Lower Netherwood, Dumfries
1884 Hunter, James, Lochside, Lockerbie
1886 Hutchison, John, Milnhead, Dumfries
1880 Hyslop, Wm., Glenries, Sanquhar
1870 Irvine, B., Assembly Street, Dumfries

Admitted

- 1883 Irving, D. J. Bell, yr. of Whitehill, Lockerbie
 1869 Irving, J. Bell, of Whitehill, Lockerbie
 1885 Irving, H. C., yr. of Burnfoot, Ecclefechan
 1872 Irving, Samuel, Carco, Kirkcunell
 1886 Jamieson, John, Waterhead, Lockerbie
 1846 Jardine, James, of Dryfeholm, Lockerbie
 1888 Jardine, Jas. C., Broomhills, Annan
 1863 JARDINE, Sir Robert, of Castlemilk, Bart., M.P., Lockerbie
 1890 Jeffrey, John J., Blackaddie, Sanquhar
 —Free Life Member
 1860 Johnston, Lieut.-Gen., of Carnsalloch, Dumfries
 1877 Johnston, James, Gairloch, Dumfries
 1859 Johnston, Thomas, Moffat
 1878 Johnston, Wm., of Cowhill, Dumfries
 1886 Johnstone, Andrew J. S., of Halleaths, Broadholm, Lockerbie
 1860 Johnstone, James, Banker, Dumfries
 1873 Johnstone, James, Hunterheck, Moffat
 1859 Johnstone, John A., Archbank, Moffat
 1870 Johnstone, J. J. Hope, of Annandale, Raehills, Lockerbie
 1866 Johnstone, Miss Hope, of Annandale, Marchbank Wood, Moffat
 1881 Johnstone, Michael, Archbank, Moffat
 1859 Johnstone, Robert, Polmoodie, Moffat
 1859 Johnstone, Walter, Alton, Moffat
 1863 Kennedy, David, Castlehill, Dumfries
 1864 Kerr, Abram, Castlehill, Durrisdeer
 1878 Kerr, Archd., Upper Dormont, Lockerbie
 1875 Kerr, Jn., Blountfield, Ruthwell, R.S.O.
 1875 Kirkpatrick, David, Annisfield, Townfoot, Dumfries
 1879 Kirkpatrick, Jas., Rigghead, Torthorwald
 1870 Kirkpatrick, James, Auctioneer, Annan
 1884 Lawrie, John P., Shiekthill, Lochmaben
 1878 Lennox, David, Merchant, Dumfries
 1865 Leny, W. Macalpine, of Dalswinton, Dumfries
 1873 Lindsay, James, Whitecastles, Lockerbie
 1869 Little, James, Sark Tower, Canonbie
 1878 Little, James Church, Burnfoot, Langholm
 1884 Little, John Malcolm, Carlesgill, Langholm
 1888 Little, Murray, Solicitor, Annan
 1885 Lockhart, Peter, Springkell Estate Office, Ecclefechan
 1870 Lusk, Andrew, Lochvale, Dumfries
 1870 Lyon, Thomas A., Whitcroft, Ruthwell, R.S.O.
 1887 McCall, Alexander, Rock Hall Mains, Collin, Dumfries
 1870 McCall, George, Leithenhall, Moffat
 1870 McCall, James, of Catloch, Moniaive
 1878 McClure, Wm., Banker, Lockerbie
 1868 McConnel, Fred., of Blackyett, Annan
 1882 MacCowan, A., of Newtonsairs, Holywood
 1888 McCreath, John, Comlongan Mains, Ruthwell, R.S.O.
 1887 Macdonald, Alexander, Grain Merchant, Lockerbie
 1878 Macfarlan, George, Closeburn Mains, Thornhill
 1885 McGibbon, James R., Union Bank, Moffat
 1860 McGill, James, Banker, Dumfries
 1886 McIntosh, A. J., V.S., Dumfries
 1887 M'Jannet, F. J., Gateslack, Thornhill
 1888 M'Jarrow, David, Solicitor, Lockerbie
 1878 Mackay, D., Hurlisdale, Cummertrees, Annan
 1886 Mackenzie, John A., Solicitor, Lockerbie

Admitted

- 1879 M'Kenzie, Neil, Holystone, Thornhill
 1860 Mackie, John, Sarkshields, Ecclefechan
 1870 M'Millan, John, of Glencrosh, Moniaive
 1886 M'Nae, Robert, V.S., Dumfries
 1878 M'Tier, John, of Ladyfield, Dumfries
 1840 Malcolm, W. E., of Burnfoot, Langholm
 1880 Martin, William, Dardarroch, Dumfries
 —Free Life Member
 1889 Maxwell, Chas. H., The Grove, Dumfries
 1870 MAXWELL, Sir John R. Heron, of Springkell, Bart., Ecclefechan
 1865 Maxwell, Francis, of Gribton, Dumfries
 1873 Maxwell, George, of Broomholm, Langholm
 1882 Maxwell, Joseph, Seedsman, Thornhill
 1867 Maxwell, Maxwell Hyslop, of The Grove, Dumfries
 1869 Maxwell, General Harley, of Portrack, Dumfries
 1886 Millar, Wm., Lakehead, Closeburn, Thornhill
 1878 Milligan, James, Hayfield, Thornhill
 1870 Milligan, John, Auldgerth, Dumfries
 1886 Milne, Thomas, Grain Merchant, Lockerbie
 1870 Minto, John D., Dumfries
 1878 Mitchell, Joseph, Bankhead, Dalswinton, Dumfries
 1870 Mitchell, Joseph M., Burnscaith Green, Dumfries
 1860 Moffat, James, Gateside, Sanquhar
 1862 Moffat, Thomas, Nunwood, Dumfries
 1883 Moffat, Wm., Garwald, Langholm
 1878 Monilaws, Rev. James J., Middlebie Manse, Ecclefechan
 1878 Murray, Allan, Castlemilk Mill, Lockerbie
 1886 Newbigging, Thos. Kennedy, Nurseryman, Dumfries
 1870 Paterson, David J., Watch Hall, Annan
 1889 Paterson, Francis, Clerkhill, Langholm
 1885 Paterson, John S., Craigarroch, Sanquhar
 1881 Paterson, J. Jardine, of Balgray, Lockerbie
 1854 Paterson, J. W. J., Terrona, Langholm
 1884 Paterson, Robert, of Robgill Tower, Ecclefechan
 1878 Paterson, Robert B., V.S., Irving Street, Dumfries
 1885 Paterson, Wm., E. Craigarroch, Sanquhar
 1886 Paterson, Wm., Rock Hall, Dumfries
 1878 Payne, James, 82 Irish Steet, Dumfries
 1884 Primrose, John, Solicitor, Dumfries
 1869 QUEENSBERRY, The Marquis of, Kinmount, Annan
 1888 Rae, James, of Kirkpatrick-Fleming and Newton, Ecclefechan
 1884 Rain, Rev. Thos., Hutton Manse, Lockerbie
 1874 Ranken, John S., Lawesknowe, Moffat
 1891 Rankin, William, Waulkmill, Thornhill
 1886 Rannie, D. W., of Conneath, Dumfries
 1857 Reid, J., Corsebank, Sanquhar
 1878 Rennie, James, Brewer, Dumfries
 1884 Richardson, John, Braehead, Heck, Lockerbie
 1878 Richardson, William, Fioshend, Greta
 1884 Richardson, Wm., Cotland, Dumfries
 1884 Roddick, Frank, Traillrow, Ecclefechan
 1878 Scott, Robert A., Kirkbank, Dumfries
 1877 Semple, Wm., Mouswald Banks, Ruthwell, R.S.O.
 1878 Sloan, James, Coachbuilder, Dumfries
 1883 Sloan, Hugh, Gillenbie, Lockerbie
 1878 Smith, Edward, Oakfield Terrace, Noblehill, Dumfries
 1877 Smith, Robert, Dalzibble, Dumfries

Admitted

- 1870 Smith, Thomas, Terrona, Langholm
 1873 Smith, Thomas K., Park View, Closeburn, Dumfries
 1859 Steuart, Patrick, Middlegill, Moffat
 1870 Stewart, Donald, Morton Mains, Thornhill
 1860 Stewart, Peter, Dornock Mains, Annan
 1867 Stobo, Andrew, Porterstown, Auldirth
 1886 Stobo, James, Halliday Hill, Auldirth
 1878 Struthers, William, Logan Mains, Canonbie
 1886 Symons, John, Solicitor, Dumfries
 1870 Taylor, Joseph, Potholm, Langholm
 1878 Thompson, Alexander, Ironmonger, Dumfries
 1869 Thomson, J. S., Brae, Dumfries
 1878 Thomson, Robert, of Brae, Dumfries
 1878 Thomson, William, M'Cheynston, Auld-girth
 1878 Todd, Alex., Mouswald Grange, Ruthwell, R.S.O.
 1884 Todd, John, Tinwald Shaws, Dumfries
 1890 Underwood, Wm., Ironmonger, Annan
 1873† Villiers, F. E., Closeburn Hall, Thornhill
 1858 Walker, Lieut.-Col. Geo. C., of Crawfordton, Thornhill
 1886 Wallace, James R. W., Auchenbrack, Thornhill
 1889 Wallace, John William, Holm Hill, Thornhill
 1885 Wallace, William, of Whitewoolen, Lockerbie
 1856 Warwick, W., Arkinholm Terrace, Langholm
 1875 Waugh, John, Granton, Moffat
 1884 Waugh, John, Shillahill, Lockerbie
 1886 Whitelaw, James W., Solicitor, Dumfries
 1884 Whittle, Jn., Trigary, Closeburn, Thornhill
 1869 Wightman, John Seton, of Courance, Lockerbie
 1890 Williamson, Capt. Cecil Hedworth, Carnallock, Dumfries
 1880 Wilson, George, Dalveen, Thornhill
 1870 Wilson, James R., Banker, Sanquhar
 1878 Wilson, P. M'C., Nether Gribton, Dumfries
 1877 Wright, Thomas, Bengall, Lockerbie
 1864 Yorstoun, M. C., of Tinwald, Irvine House, Canonbie

KIRKCUDBRIGHT.

- 1889 Adamson, John, of Craigadam, Dalbeattie
 1870 Anderson, Robert, Alleyford, Kirkgunzeon
 1889 Barbour, Wm., Troquhain, New Gallo-way
 1884 Barrowman, John H., Caigton, Castle-Douglas
 1871 Bell, William, of Gribda, Kirkcudbright
 1878 Berwick, John, Whiteside, Kirkgunzeon
 1878 Biggar, James, Grange Farm, Dalbeattie
 1858 Biggar, Thos., of Chapelton, Dalbeattie
 1886 Biggar, Wm., Chapelton, Dalbeattie
 1886 Blackett, Lieut.-Col. C. E., of Arbigland, Dumfries
 1878 Brown, John, Airds of Kirkconnell, New Abbey
 1878 Brown, John Gordon, Lochanhead, Dumfries
 1870 Brown, Joseph, Hermitage, Dalbeattie
 1861 Brown, Oliphant, Mains of Duchrae, Castle-Douglas
 1864 Brydon, Jas., Knocknarling, New Gallo-way
 1853 CAIRD, Right Hon. Sir James, of Cassen-cary, K.C.B., Creetown

Admitted

- 1885 Campbell, Robert J., Cuil, Castle-Douglas—*Free Life Member*
 1888 Campbell, Thomas, V.S., Kirkcudbright
 1856 Campbell, T. W., of Walton Park, Dalbeattie
 1879 Cannon, James, Urioeh, Castle-Douglas—*Free Life Member*
 1877 Cannon, John, Rosebank, Dalbeattie
 1874 Chalmers, Archd., of Kipp, Dalbeattie
 1890 Clift, Edward A., Goldieale, Dumfries
 1860 Corrie, Adam, South Park, Kirkcudbright
 1860 Craig, Joseph, of Threecrofts, Loch-rutlon, Dumfries
 1878 Craik, Geo., Argrennan Mains, Tongland
 1857 Crawford, Peter, Carruchan, Troqueur
 1866 Cunningham, R. D. B., of Hensol, Castle-Douglas
 1864 Cunningham, Jas., Tarbreoch, Dalbeattie
 1889 Cunningham, John, Tarbreoch, Dalbeattie
 1879 Currie, John, Kukeoch, Kirkcudbright
 1878 Douglas, Wm. D. R., of Orchardton, Castle-Douglas
 1851 Dudgeon, Patrick, of Cargen, Dumfries
 1877 Dudgeon, R. F., The Grange, Kirkcudbright
 1889 Duncan, James, East Glenarn, Crocketford, Dumfries
 1884 Dunlop, Captain H. L. Murray, of Corsock, Dalbeattie
 1886 Farish, James, Lmeluden Mains, Dumfries
 1889 Fergusson, Robert W., of Kilquhanity, Dalbeattie
 1859 Frazer, John, Maxwellfield, New Abbey, Dumfries
 1860 Gibson, J. T., Tullowquhairn, Kirkbean
 1884 Gibson, Robert, Hightae, Castle-Douglas
 1888 Gillespie, William, Solicitor, Castle-Douglas
 1886 Gilmour, W. P., Balmangan, Kirkcudbright
 1886 Gordon, Alexander J., Kirkcudbright
 1885 Gordon, Edward, Keltonhill, Castle-Douglas
 1877 Gordon, James, Castle-Douglas
 1846 Gordon, R. M., of Rattrra, Kirkcudbright
 1879 Gordon, Sir William, of Earliston, Bart., Kirkcudbright
 1878 Gray, Adam, jun., Ingleston of Borgue, Kirkcudbright
 1859 Grierson, Joseph, Breoch, Castle-Douglas
 1859 Grierson, Wm., 41 Queen Street, Castle-Douglas
 1869 Hamilton, George, Ardendee, Kirkcudbright
 1878† HERRIES, Right Hon. Lord, Kinharvey, New Abbey
 1853 Herries, A. Y., of Spottes (16 Heriot Row, Edinburgh), Dalbeattie
 1857 Hewat, Richard, Writer, Castle-Douglas
 1878 Hood, David A., Balgeddan, Kirkcudbright
 1884 Hood, Wm., Chapelton, Borgue
 1877 Hope, Hon. Charles, St Mary's Isle, Kirkcudbright
 1886 Hope, John, Commander R.N., St Mary's Isle, Kirkcudbright
 1878 Houston, John, Overlaw, Kirkcudbright
 1878 Houston, John, The Hill, Castle-Douglas
 1886 Hughan, Major Henry H., of Airds, Castle-Douglas
 1880 Hutchison, Graham, of Balmaghie, Castle-Douglas
 1879 Hutchison, J. W., of Edinghame, Castle-Douglas
 1870 Hyslop, And., Auchenroch, Dalbeattie

Admitted

- 1871 Kay, D. J., of Drumpark, Dumfries
 1846 Kennedy, J. L., of Knocknalling, Dalry,
 Galloway
 1878 Kennedy, J. M., yr. of Knocknalling,
 Dalry, Galloway
 1890 Kerr, Jas., Mid-Kelton, Castle-Douglas
—Free Life Member
 1870 Kerr, Jos., Flatts of Cargen, Dumfries
 1860 Kerr, Thomas, Kirkchrist, Kirkcudbright
 1891 Kirwan, Major Wm. F. Maitland, of Gel-
 ston, Castle-Douglas
 1878 Kirwan, L. M., Collin, Auchencairn
 1848 Laurie, W. K., of Woodhall, Castle-
 Douglas
 1864 Ludderdale, W. H., Writer, Castle-Douglas
 1878 Little, Wm., High Borgue, Twynholm
 1889 Livingston, Alexander, Lochside, Loch-
 rutton, Dumfries
 1878 M'Conchie, John, Carsewillough, Creetown
 1878 M'Cormuck, John, Lochenkitt, Corsock,
 Dalbeattie
 1849 M'Culloch, Walter, of Ardwell, Gate-
 house
 1876 MacKerrow, M. S., Boreland of South-
 wick, Dumfries
 1875 M'Kie, Andrew, Blakket, Crocketford
 1878 M'Kie, John, of Bargaly, Castle-Doug-
 las
 1882 Mackie, John Gladstone, of Auchencairn,
 Castle-Douglas
 1878 M'Kinnel, Wm., Butterhole, Dalbeattie
 1876 M'Larin, Dugald, Dalbeattie
 1879 M'Nab, R. W., Banker, Dalbeattie
 1870 M'Queen, James, of Crofts, Dalbeattie
 1876 M'Taggart, John, Culnaightry, Castle-
 Douglas
 1878 M'Turk, W. A., Barlae, Dalry, Galloway
 1888 M'Whelan, John, Carantyne Villa, Dal-
 beattie
 1885 Marshall, Wm., Loch Fergus, Kirkcud-
 bright
 1878 Maxwell, George, of Glenlee, New Gallo-
 way
 1878 Maxwell, James, Screel, Castle-Douglas
 1878 Maxwell, W. J., Terregles Banks, Dum-
 fries
 1879 Maxwell, Wellwood, of Kirkennan, Dal-
 beattie
 1886 Maxwell, Wellwood, of The Forest, New
 Galloway
 1839† Maxwell, Wellwood II., of Munches, Dal-
 beattie
 1886 MAXWELL, Sir W. F., of Cardoness, Bart.,
 Gatehouse
 1873 Maxwell, W. J., yr. of Munches, Ter-
 raughtie, Dumfries
 1878 Mitchell, Andrew, Barcheskie, Kirkcud-
 bright
 1867 Moffat, James, of Kenervie, Banker,
 Castle-Douglas
 1878 Montgomery, Andl., of Netherhall, Castle-
 Douglas
 1879 Montgomery, John, Comstonend, Twyn-
 holm
 1878 Montgomery, William, Banks, Kirkcud-
 bright
 1886 Morris, Christopher, of Barons Craig,
 Dalbeattie
 1878 Muir, James, Lochfergus, Kirkcudbright
 1877 Muir, Wm., Lochdougan, Castle-Doug-
 las
 1879 Murray, B. R., of Parton, Castle-Douglas
 1879 Murray, G. R., yr. of Parton, Castle-
 Douglas
 1890 Nicholson, William, Bombie, Kirkcud-
 bright
 1873 Nivison, Stewart, Lairdlaugh, Dalbeattie
 1878 Owens, Walter, Torr House, Castle-
 Douglas
 1889 Picken, David L., Milton, Kirkcudbright

Admitted

- 1883 Rae, William, 6 Portland Place, Maxwell-
 town
 1870 Rain, Wm., Kempleton, Twynholm
 1861 Rigg, Wm., Banks, Kirkcudbright
 1883 Shennan, John K., Balig, Kirkcudbright
 1883 Shennan, R., Balig, Kirkcudbright
 1857 Skirving, Adam, of Croys, Dalbeattie
 1882 Smith, Jas., Standingstone, Twynholm,
 Castle-Douglas
 1877 Spalding, A. F. M., of Holm, New Gallo-
 way
 1870 Sproat, R., Lennox Plunton, Kirkcud-
 bright
 1878 Sproat, W. T., Borgue House, Kirkcud-
 bright
 1857 Stewart, H. G. Murray, of Broughton,
 Gatehouse
 1886 Stewart, Robert, of Culgruff, Cross-
 michael
 1878 Stewart, Captain William, of Shambellie,
 Dumfries
 1868 Symington, G. C., Kirkcarswell, Kirk-
 cudbright
 1877 Tayleur, Edward, of Dalskaith, Dum-
 fries
 1889 Taylor, James, Meikle Ernambrie, Castle-
 Douglas
 1884 Templeton, Matthew, Dromore, Kirkcud-
 bright
 1869 Thomson, John, Laggan, Gatehouse
 1886 Timmus, H. A., of Slogarie, New Gallo-
 way
 1878 Veitch, Andrew, Girthon Kirk, Gate-
 house
 1879 Wallace, J., Foundry, Castle-Douglas
 1886 Wallace, M. G., Terreglestown, Dum-
 fries
 1879 Wallace, R., Foundry, Castle-Douglas
 1870 Wallace, R., Langbarns, Kirkcudbright
 1886 Walleet, John, Auction Mart, Castle-
 Douglas
 1879 Williamson, A., Meikle Spyland, Kirk-
 cudbright
 1871 Williamson, Thos., Merchant, Kirkcud-
 bright
 1878 Wylie, Wm., Pleasance of Cargen, Dum-
 fries

WIGTOWN.

- 1850 Agnew, Sir Andrew, of Lochnaw, Bart.,
 Stranraer
 1843 Agnew, R. V., of Sheuchan and Barn-
 barroch, Stranraer
 1875 Agnew, William, Balwherrie, Stranraer
 1878 Anderson, Charles, Barsalloch, Port
 William
 1864 Anderson, Peter, Callenders House,
 Whithorn
 1878 Barbour, Robert, Balgowan, Ardwell,
 Stranraer
 1878 Black, Thomas, Craigencrosh, Stranraer
 1861 Blair, E. H. Maxwell, of Penninghame,
 Newton-Stewart
 1878 Broadfoot, Peter, West Mains, Kirkinner
 1890 Campbell, Robert, jun., Craichmore,
 Stranraer
 1874 Chisholm, Jn., East Kirkland, Wigtown
 1877 Cochran, Robert, Caldons, Stoneykirk
 1885 Cochran, William, Auchentibbert, Sand-
 head, Stranraer
 1869 Cowan, George, Mains of Park, Glenluce
 1870 Drew, James, of Craigencallie, Newton-
 Stewart
 1891 Drynan, Thomas Wallace, Carscreugh,
 Glenluce
 1889 ELLIOT, The Hon. Hugh F. H., of Cor-
 war, M.P., Newton-Stewart
 1878 Forsyth, John, Reiffer Park, Sorbie

Admitted

- 1867 Frederick, D., of Gass, Stranraer
 1869 Frederick, Robt., Drumflower, Dunragit
 1877 Frederick, Thomas, Cairnhandy, Stoney-
 kirk
 1860†GALLOWAY, Right Hon. The Earl of, Gal-
 loway House, Garlieston
 1871 Gourlay, R. C., Arbrack, Whithorn
 1880 Greig, T. C., Rephal, Stranraer
 1878 Hardie, J., jun., Mull of Galloway, Stran-
 raer
 1848 HAY, Sir J. C. D., of Park Place, Bart.,
 Glenluce
 1870 Hewetson, Jos., Balterson, Newton-
 Stewart
 1877 Hughan, Peter H., Cults, Whithorn
 1885 Hunter, James, Culgroat, Stranraer
 1888 Hunter, Wm., Garthland Mains, Stran-
 raer
 1871 Jamieson, Thomas, High Carghie, Drum-
 oie, Stranraer
 1867 Lang, Alex., Boreland, Glenluce
 1878 Lockhart, James, Mains of Airds, Stran-
 raer
 1878 Logan, David, Fernbank, Stranraer
 1843 Lorimer, T. W., Newton-Stewart
 1877 Lusk, Peter, Craigeallie, Stranraer
 1888 M'Caig, John, Challoch, Leswalt, Stran-
 raer
 1887 M'Caig, John, High Mye, Stoneykirk
 1875 M'Canon, John, Kirronrae, Stranraer
 1878 M'Clew, David A., Chapel Rossan, Stran-
 raer
 1878 M'Conchie, A., Mains of Penninghame,
 Newton-Stewart
 1857 M'Connell, J. A., Chapelheron, Whithorn
 1878 M'Connell, Thomas M., V.S., Wigtown
 1882 M'Connell, Wm., Glassnick, Kirkcowan
 1877 M'Cosh, Peter, Cairngawn, Kirkmaiden
 1877 M'Cracken, A. E., Gillespie, Glenluce
 1884 M'Cracken, Robt., Creamery, Dunragit
 1870 M'Culloch, John, Glenhead, Stranraer
 1878 M'Culloch, Peter, Whitefield, Glenluce
 1865 M'Douall, James, of Logan, Stranraer
 1870 M'Dowall, Andrew, Auchtralure, Stran-
 raer
 1878 M'Dowall, T. N., Auchtralure, Stranraer
 1878 M'Dowall, R., Auchengallie, Port Wil-
 liam
 1850 M'Gill, John, Barsalloch, Wigtown
 1870 M'Hafie, Wm. J., of Torhousemuir, Wig-
 town
 1871 M'Illraith, Thos., Barwhanny, Kirk-
 inner
 1878 M'Illwick, Alex., Quarter, New Luce
 1860 M'Lean, James, Clerk of Supply, Wig-
 town

Admitted

- 1857 Maclelland, Thos., North Balfarn, Kirk-
 inner
 1874 M'Master, Allan, Glenhead House,
 Stranraer
 1871 M'Master, Hugh, Blairbuiy, Port William
 1878 M'Master, James, Currochtree, Stranraer
 1875 M'Master, John, Culhorn Mains, Stran-
 raer
 1875 M'Master, William, Challoch, Dunragit
 1889 M'Master, Wm., junior, Cruggleton, Gar-
 lieston
 1878 M'Whinnie, Alex., Airyolland, Port
 William
 1885 Marshall, Matthew, Stranraer
 1878 Matthews, A. B., British Linen Bank,
 Newton-Stewart
 1853 Matthews, Niven, Newton-Stewart
 1877 MAXWELL, Sir H. E., of Monieith, Bart.,
 M.P., Whauphill, N.B.
 1887 Menzies, W. M., Cults, Castle Kennedy
 1875 Milroy, James, Galdenoch, Stoneykirk
 1876 Milroy, John, Balgreggan Mains, Stran-
 raer
 1877 Paterson, John, Collin, Stranraer
 1860 Picken, R., Barnkirk, Newton-Stewart
 1877 Ralston, John, Milmain, Stranraer
 1885 Ralston, Robert, Greyhill, Stoneykirk
 1883 Ralston, Wm. H., Culmore, Stranraer
 1878 Rankin, Alex., Aird, Stranraer
 1878 Rontledge, C. M., Banker, Port William
 1878 Rontledge, J. J. F., Old Mill, Port Wil-
 liam
 1870 Rontledge, Wm., Elrig, Port William
 1878 Smith, William, Craigdhu, Glasserton
 1845†STAIR, The Earl of, K.T., Lochinch,
 Castle Kennedy Station
 1891 Stevenson, Robert, Balcary, Glenluce
 1869 Stewart, M. J., of Southwick, M.P.,
 Ardwell
 1846 Stewart, R. H. J., of Physgill and Glas-
 serton, Whithorn
 1868 Symington, Gilbert, Glenluce
 1871 Thompson, Alex., Barmeal, Port Wil-
 liam
 1858 Todd, James, Gillespie, Glenluce
 1869 Todd, William, Auchness, Ardwell
 1882 Walker, William, Home Farm, Garlieston
 1890 Wallace, James A., Claycrop, Kirkinner
 1887 Watson, Allan Thomson, Genoch, Dun-
 ragit
 1870 Whyte, James A., Kirkmabreck, Stran-
 raer
 1878 Wilson, John, West Freugh, Stranraer
 1878 Wither, James, Lagganmore, Portpatrick
 1885 Wright, Hugh, of Alticry, Port William
 1860 Young, J. A., Orchardtown, Garlieston

7.—INVERNESS DISTRICT.

EMBRACING THE

COUNTIES OF CAITHNESS, ELGIN, INVERNESS, NAIRN, ORKNEY
AND SHETLAND, ROSS AND CROMARTY, AND SUTHERLAND.

CAITHNESS.

- Admitted
1874 Adam, Thomas, of Lyncegar, Wick
1865 Brims, James, Thurso
1874 Brock, John, Princes Street, Thurso
1839 Brown, George, Watten Mains, Watten
1858 Gunn, Alexander, Dale, Halkirk, Thurso
1839 Gunn, James, Sibster, Wick
1847 Henderson, Alexander, of Stemster,
Thurso (39 Palmerston Pl., Edinburgh)
1883 Henderson, David P., yr. of Stemster,
Thurso (39 Palmerston Pl., Edinburgh)
1874 Henderson, A. W., of Bilbster, Wick
1883 Henderson, Capt. J. H., Rosebank, Wick
1881 Horne, Edward Wm., of Stirkoke
1873 Irvine, G. F., Shrubbery Bank, Thurso
1865 Keith, Peter, Factor, Barogill Castle,
Wick
1874 Laing, William, Skail, Thurso
1871 M'Beath, James, Brims, Thurso
1861 Miller, John, of Scrabster, Thurso
1865 Paterson, Wm., Innes, Armdale, Thurso
1881*†PORTLAND, His Grace The Duke of,
Langwell, Wick
1861 Purves, James, Barrogill Mains, Wick
1869 Purves, William, Thurdistoft, Thurso
1884 Robertson, Robert, Implement Maker,
Wick
1857 SINCLAIR, Sir J. G. T., of Ulbster, Bart.,
Thurso Castle, Thurso
1886 SINCLAIR, Sir John E. G., of Dunbeath,
Bart., Barrock House, Wick
1864 SINCLAIR, Sir Robert C., of Stevenson,
Bart., Achvarsdale Lodge, Reay,
Thurso
1872 Sinclair, W. S. Thomson, of Freswick,
Dunbeath Castle
1855 Smith, James, of Olrig, Thurso
1876 Sutherland, Alex., Ramppyards, Watten—
Free Life Member
1862 Tait, Wm. Reid, Mina Villa, Thurso
1871 Waters, George S., Tistermains, Halkirk
Road

ELGIN.

- 1889 Adam, John, Coulardbank, Lossiemouth
1885 Alcock, John, Bank of Scotland, Elgin
1884 Anderson, Robert, Viewfield, Elgin
1871 Black, James, of Sherriffston, Elgin
1871 Brown, William, Earlsmill, Forres—*Free
Life Member*, 1873
1854 Brown, Wm., of Dunkinty, Elgin
1878 Bruce, D. C., Byres, Fochabers
1884 Brydon, John, Forester, Rothes
1865 Cameron, Alexander, of Mainhouse,
Highfield, Elgin
1871 Colvin, James E., Wester Manbeen,
Elgin

- Admitted
1850 Creyk, Dr A., Dalvey, Advie, Strathspey
1878 Cruickshank, David, Meft, Elgin
1852 Cruickshank, John, Knock, Elgin
1875 Cruickshank, John, Pond Park, Craigel-
lachie
1874 CUMMING, Sir Wm. G. Gordon, of Altyre,
Bart., Forres
1839 DUNBAR, Sir Arch., of Northfield, Bart.
1888 Edgar, James, Nether Bogside, Elgin
1855 Ferguson, John, Lossiemouth
1853 Garden, Arch., of Bernery, Forres
1890 Gilchrist, Wm., Leuchars, Elgin
1860 Gordon, George, Land Surveyor, Elgin
1864†Grant, C. Macpherson, of Drumdrian,
Forres
1859†GRANT, Sir George Macpherson, of Ballin-
dalloch, Bart.
1883 Grant, John Macpherson, yr. of Ballin-
dalloch
1879 Grant, J., Mains of Advie, Advie
1871 Grant, John, Inverlaidnan, Carr Bridge
1862 Grant, William, Wester Alves, Forres
1880 Haddon, P. M., St Mary's, Orton, Foch-
abers
1883 Henderson, Peter, Factor, Ballindalloch
1864 Hunter, John, Dipple, Fochabers
1888 Hutcheson, James, W.S., Elgin
1874 Lawrence, James, Forres Mills, Forres
1858 Leitch, A. K., Inchstelly, Forres
1865 M'Bean, D., Auchterblair, Carr Bridge
1886 M'Gregor, Captain James, Balmenach,
Cromdale
1883 Macdonald, Wm., Carsewell, Alves
1870 Mackay, H. M. S., Banker, Elgin
1870 Mackay, R. J., Burgie Lodge, Forres
1882 Mackenzie, F. C., Forres
1886 Mackenzie, Thomas, Carron, Strathspey
1882 Mackessack, George R., yr. of Ardgry
and Roseisle, Forres
1865 Mackessack, James, Earnside, Forres
1857 Mackessack, John, Balnaferry, Forres
1874 Mackessack, John, Kinloss, Forres
1864 Mackessack, Robert, of Ardgry and
Roseisle, Forres
1882 Mackessack, R. H., Newton of Struthers,
Forres
1891 MacLeod, Captain Norman, of Dalvey,
Forres
1876 M'William, James, Stonytown, Keith
1875 Peterkin, James Grant, of Grange, Forres
1871 Petrie, George, Rosehaugh, Elgin
1883 Petrie, George, Pitairlie, Elgin
1870 Petrie, William, Kirkhill, Elgin
1876 Petrie, W. A., Rosebrae, Elgin
1873 Reid, Alexander, Architect, Elgin
1874 Robertson, William, Linkwood, Elgin
1870 Robertson, Wm. A., Mayfield, Forres
1870 Ross, Dr James, Linkfield, Elgin
1883 Russell, Alex., Myreside, Elgin

Admitted

- 1874 Scott, Robert, Easter Manbeen, Elgin
 1877 Sutor, James, The Collie, Fochabers
 1883 THURLOW, Right Hon. Lord, Dunphail, Forres
 1875 Tilloch, John, Grangegreen, Forres
 1882 Urquhart, Robert, jun., Forres
 1859 Walker, Robert, Altyre, Forres
 1864 Walker, William, Kintree, Elgin
 1883 Watson, H. A., U.P. Manse, Forres—
Free Life Member
 1875 Watt, James, Surradale, Westfield, Elgin
 1881 Wedderspoon, James, Fochabers
 1870 Wight, Alexander, Ironmonger, Forres
 1864 Yool, Thomas, Calcots, Elgin
 1852 Young, Alex., Findrassie House, Elgin
 1871 Young, James, Waterton, Elgin

INVERNESS.

- 1865 ABINGER, Right Hon. Lord, Inverlochy Castle, Kingussie
 1865 Alison, James M., Beaully
 1874 Allan, William, Clury, Dulnain Bridge
 1865 Anderson, James, Solicitor, Inverness
 1889 Anderson, William, Solicitor, Inverness
 1886 Baillie, A. C., Dochgarroch, Inverness
 1883 Baillie, James E. B., of Dochfour, Inverness
 1880 Baird, John, of Knoydart, Inverie House, Ornsay, Skye
 1891 Barron, James, Editor of the *Inverness Courier*, Inverness
 1882 Baxter, Frederick, Seedsman, Inverness
 1863 Bethune, Angus, Seafield, Inverness
 1883 Birnie, Alex., Wellhouse, Beaully
 1874 Biscoe, T. Ramsay, of Newton, Inverness
 1883 Black, Robert, C.E., Inverness
 1874 Blair, Patrick, Sheriff-Substitute, Inverness
 1877 BLANTYRE, Hon. The Master of, Eilanreach, Glenelg
 1891 Cameron, Angus, Ben Nevis Auction Mart, Fort-William
 1859 Cameron, Donald, of Lochiel, Auchnacarry, Fort-William
 1890 Cameron, James, Coulnakyle, Nethy Bridge, R.S.O.
 1884 Campbell, A. D., of Kilmartin, Glen Urquhart
 1891 Campbell, G. J., Solicitor, Inverness
 1891 Cattell, James, Balnaglack, Petty, Inverness
 1865 Chisholm, Duncan, 42 Waterloo Place, Inverness
 1874 Chisholm, John, 8 Academy Street, Inverness
 1871 Cran, Jn., Kirkton, Bunchrew, Inverness
 1874 Cumming, James, Allanfean, Inverness
 1865 Davidson, Robert, 29 Academy Street, Inverness
 1883 Davidson, Samuel, Guisachan, Beaully
 1883 Dick, W. G., Horse-hirer, Inverness
 1865 Dougall, Andrew, Railway Manager, Inverness
 1887 Duncan, James, Fern Villa, Inverness
 1862† DUNMORE, Right Hon. The Earl of, Isle of Harris
 1874 Elliot, Matthew, Flesher, Inverness
 1890 Ferguson, Fergus, Monkstad, Uig, Portree
 1865 Forbes, Duncan, of Culloden, Inverness
 1874 Fraser, Alexander, Commercial Bank, Inverness
 1857 Fraser, Alex., Sheriff-Substitute, Portree
 1883 Fraser, David, Dalneigh, Inverness
 1889 Fraser, Donald, of Millburn, Inverness
 1840 Fraser, Evan Baillie, Redburn, Inverness
 1858 Fraser, Hugh, Balloch of Culloden, Inverness

Admitted

- 1874 Fraser, James, C.E., Inverness
 1874 Fraser, James, Mauld, Beaully
 1865 Fraser, Captain John, of Balnain, Stratherrick
 1865 Fraser, William, Annfield, Inverness
 1885 Gordon, James G., Elmwood, Inverness
 1886 Grant, John Brown, Erchless, Beaully
 1874 Grant, Major Wm., Drumblae, Glen Urquhart
 1883 Grant, Wm. R., Solicitor, Inverness
 1854 Gregory, A. A., of Westwood, Inverness
 1882 Gunn, Alex., V.S., Balloan, Muir of Ord
 1874 Hay, Alexander Penrose, Riverdale, Inverness
 1886 Honeyman, Thos., Auchnacarry, Fort-William
 1865 Howden, John, Inverness
 1883 Howe, Thos., Pairs of Inshes, Inverness
 1875 Hugonin, R., Kinnymlies House, Inverness
 1874 Innes, Charles, Solicitor, Inverness
 1883 Jones, R. E., Glenmoidart, Salen
 1874 Kelman, William, West Lovat, Beaully
 1889 Kemble, Major, Knock, Skye
 1890 Kennard, Cecil, Toimore, Broadford, Skye
 1884 Lawson, Robt., Beaufort Farm, Beaully
 1853 Lawson, Wm., 13 Ardconnel Terrace, Inverness
 1891 Linton, Andrew, Inchree, Onich, N.B.
 1891 Macallister, Thomas S., Inverness
 1873 Macandrew, Sir Henry C., The Castle, Inverness
 1883 M'Bean, Wm., Cradle Hall, Inverness
 1889 Maccoll, Rev. Canon Hugh, Rosse Parsonage, Fort-William
 1841 Macdonald, Alex., Wine Merchant, Inverness
 1883 Macdonald, Alex., Balintore, Bogroy
 1884 M'Donald, Alex., Portree
 1874 Macdonald, A. R., Ord, Isle of Ornsay
 1883 Macdonald, Allan, Solicitor, Inverness
 1883 M'Donald, Charles, Knocknageal, Inverness
 1865 Macdonald, D. P., Invernevis, Fort-William
 1888 Macdonald, Donald, Lynedale, Portree
 1884 M'Donald, Harry, Viewfield, Portree
 1889 Macdonald, Hugh, Coach Proprietor, Fort-William
 1891 Macdonald, J. H., Charleston, Inverness
 1846 Macdonell, E. R., of Morar, Fort-William
 1882 Macdonell, R. T., Morar, Fort-William
 1865 MacEwen, John C., Inverness
 1879 M'Gillivray, Allan, Gordon Hall, Kingussie
 1874 M'Gillivray, John, Ballachroan, Kingussie
 1876 MacGillivray, William, Eoligary, Barra
 1877 M'Gregor, Archd., Glenforsa, Salen, Ardgour
 1891 M'Intosh, Charles, Craggie, Inverness
 1889 M'Intosh, Donald, West End Hotel, Fort-William
 1889 MacIntosh, James, Factor, Ostaig, Isle Ornsay, Skye
 1879 Mackay, G. Grant, of Glengloy, Kingussie
 1875 Mackenzie, Alexander, Silverwells, Inverness
 1878 Mackenzie, Alex., Banker, Beaully
 1891 Mackenzie, Dr Murdo T., Scolpaig, North Uist
 1874 Mackenzie, N. B., British Linen Bank, Fort-William
 1886 Mackenzie, Wm. D., of Farr, Inverness (Fawley Court, Henley-on-Thames)
 1883 Mackintosh, A. D., of Mackintosh, Moy Hall, Inverness
 1866 Mackintosh, C. Fraser, of Drummond, M.P., Inverness

Admitted

- 1846 Mackintosh, Æneas, of Balmespiek, Inverness
 1844 Mackintosh, Æneas W., of Raigmore, Inverness
 1844 Mackintosh, A., of Holme, Inverness
 1883 Mackintosh, Hugh, Ironmonger, Inverness
 1883 Mackintosh, James, 20 Petty Street, Inverness
 1877 Mackintosh, John, South Kinrara, Aviemore
 1875 Maclean, Charles, Milton, Lochmaddy
 1875 M'Leish, Daniel, Bank of Scotland, Fort-William
 1830 Macleod, Norman, of Macleod
 1883 M'Millan, E. H., Caledonian Bank, Inverness
 1878 Macpherson, C. J. B., of Beleville, Kingussie
 1887 Macpherson, Col. Ewen, of Cluny Macpherson, Kingussie
 1870 Macpherson, Colonel Lachlan, of Glen-truim, Newtonmore
 1888 Macpherson, L. A., of Corrimony, Inverness
 1883 Macquoen, A. T., Culmore, Inverness
 1883 Macrae, Alex. D., Ruthven, Kingussie
 1891 Macrae, Horatio Ross, W.S., of Clunes, Inverness (57 Castle St., Edinburgh)
 1874 Macrae, Roderick, Mains of Erchless, Beaully
 1883 MacTavish, Alex., Implement Maker, Inverness
 1869 Malcolm, George, Craigard, Invergarry
 1883 Manners, C. R., C.E., Inverness
 1884 MARJORIBANKS, Hon. Edward, M.P., yr. of Guisachan, Beaully
 1883 Marr, Alex., Dalcross, Fort-George Station
 1865 Martin, John, Docharn, Boat of Garten, Strathspey
 1889 Martin, Nicol, of Glendale, Dunvegan
 1883 Merry, A. W., of Belladrum, Beaully
 1883 Merry, C. J., Belladrum, Beaully
 1874 Mundell, John, Tarradale, Muir of Ord
 1878 Mundell, Walter, Gollanfield, Fort-George Station
 1864 Munro, D., Milton, Fort-George Station
 1874 Munro, John, Seedsman, Inverness
 1890 Nicholson, Arthur Wm., Arisaig House, Fort-William
 1887 Orde, A. G. Campbell, yr. of Kilmory, Newton, Lochmaddy
 1883 Paterson, Donald, Askernish, South Uist, Oban
 1891 Paterson, Donald, Millton, Culloden, Inverness
 1854 Peter, John, Croyard, Beaully
 1883 Roberts, Wm., Dell of Inches, Inverness
 1883 Roberts, Wm., Kingussie
 1874 Robertson, John, of Grishernish, Portree
 1883 Robertson, Thomas, Highland Railway, Inverness
 1890 Rose, Hugh Francis, of Holme Rose, Fort-George
 1865 Rose, James, Mains of Connage, Fort-George Station
 1865 Rose, John, Leanach, Inverness
 1883 Ross, Alex., Architect, Inverness
 1874 Ross, Duncan, Hilton, Inverness
 1883 Ross, James, Solicitor, Inverness
 1883 Ross, Wm., Seafiel of Raigmore, Inverness
 1890 Shaw, Alexander, Farraline Mains, Inverness
 1883 Shaw, Duncan, W.S., Inverness
 1870 Sim, Henry, Cattle Salesman, Inverness
 1875 Sinclair, John, Achintee, Fort-William
 1891 Sinton, P. J., Glennevis, Fort-William

Admitted

- 1865 Smith, John, Inverallan House, Grantown
 1884 Stewart, D. A., Ensay, Obhe
 1852 Stewart, John, of Ensay, Scorrybreck, Portree
 1883 Stirling, John, of Fairburn, Beaully
 1883 Stuart, W. G., Inverness
 1857 Swinburne, Captain, R.N., of Eilan Shona, Strontian
 1883 Thomson, David, V.S., Inverness
 1874 Thomson, J. Grant, Grantown, Strathspey
 1890 Tod, David, Kingsburgh, Portree
 1875 Trotter, R., Garguston, Muir of Ord
 1855 TWEEDMOUTH, Right Hon. Lord, Guisachan House, Beaully
 1883 Tytler, Edward G. F., of Aldourie, Inverness
 1889 Urquhart, Farquhar, Seedsman, Inverness
 1861 Walker, Fountaine, of Ness Castle, Inverness
 1875 Walker, Geo. A., Torbreck, Inverness
 1883 Walker, George, Wood Merchant, Inverness
 1886 Watson, James, 29 Southside Road, Inverness
 1891 Weir, James, Achnasaul, Fort-William

NAIRN.

- 1856 Anderson, Robert, of Lochdhu, Nairn
 1883 Boden, W. F., Kinsteary Lodge, Nairn
 1883 Brodie, Caithness, The Drum, Nairn
 1878 Cameron, Dr James Angus, of Firhall, Nairn
 1830 CAWDOR, Right Hon. The Earl of, Cawdor Castle, Nairn
 1883 Clarke, Lieut.-Col. M. A., Achareidh, Nairn
 1854 Crawford, John, Nairn
 1883 Donaldson, H. T., Banker, Nairn
 1839 Fraser, Robert, Brackla, Nairn
 1852 Fraser, William, of Kilmuir and Newton, Nairn
 1883 Hebden, A. C., Nairn
 1865 Joss, John, Budgate, Cawdor
 1872 Macdonald, Donald, The Park, Nairn
 1874 MacGregor, R., Fern Cottage, Nairn
 1886 M'Intyre, Donald, Meikle Kildrummie, Nairn
 1883 Mackillican, P., Achagour, Nairn
 1882 Mann, Alex., Seabank Cottage, Nairn
 1874 Mather, John Arres, Delmes, Nairn
 1885 Mill, George, Piperhill, Nairn
 1873 Robertson, John S., Cawdor Estate Office, Nairn
 1883 Rose, Campbell, Fleenas, Nairn
 1865 Rose, Major James, of Kilravock, Fort-George Station
 1889 Walker, John Mackintosh, of Geddes, Nairn

ORKNEY AND SHETLAND.**ORKNEY.**

- 1854 Burroughs, Lieut.-General F. W. Traill, C.B., of Rousay
 1870 Cromarty, William, Widewall, St Margaret's Hope
 1872 Drever, Jas., Swanny House, Finstown
 1884 Fortescue, Wm. I., Swanbister, Kirkwall
 1875 Gibson, John, Langskaill, Rousay
 1888 Hossack, B. H., Craigfield, Kirkwall
 1879 Johnstone, James, Orphir House, Orphir
 1878 Learmonth, D. H., Housebay, Stronsay
 1877 Leitch, Simon, Elwickbank, Shapinsay
 1887 Maxwell, Henry, How, Sanday

Admitted

- 1884 Reid, Alfred, Braebuster, Kirkwall
 1884 Searth, Robert, Binscarth, Kirkwall
 1886 Sinclair, Thomas, Whitehall, Stronsay
 1884 Stephen, Donald, Northtown, Birsay
 1877 Stevenson, William, Holland, Stronsay
 1887 Thomson, Wm. D. S., Newark, Sanday
 1878 Watt, W. G. T., Kierfield House, Stromness

SHEETLAND.

- 1884 Anderson, Gilbert, Hillswick, Lerwick
 1863 Bruce, John, of Sunburgh, Lerwick
 1875 Edmondston, Mrs. of Bunes, Unst, Lerwick
 1874 Hamilton, W. Cameron, Baltasound, Unst
 1881 Hamilton, Zachray Macaulay, Sym-bister
 1876 Jaffray, James, Belmont, Unst
 1886 Manson, Anderson, Laxirth, Lerwick
 1891 Manson, Peter, Lunna, Shetland
 1876 Sandison, Alexander, Uyasound, Unst

ROSS AND CROMARTY.

- 1855 Adam, Aeneas, Humberston, Dingwall
 1870 Allan, William, Drummoneareoch, Ferringtosh, Conon Bridge
 1883 Anderson, T. A., Ballachraggan, Alness
 1862 Arras, Walter, Fodderty, Dingwall
 1889 Bell, William James, of Seatwell, Muir of Ord
 1864 Bethune, Murdo, Brae, Dingwall
 1886 Brown, Stephen, Killilan, Lochalsh
 1887 Brown, Rev. W. L. Wallace, The Manse, Alness
 1883 Cameron, Archd., Killen, Avoch
 1883 Cameron, Colin M., Balnakyle, Mun-lochy
 1869 Cameron, Duncan, Banker, Tain
 1881 Cameron, Duncan, Fettes, Inverness
 1874 Cruickshank, George, Ardmore, Tain
 1865 Darroch, Duncan, of Gourock Torridon, Achnasheen
 1881 Davidson, D., Sheriff-Substitute, Stornoway
 1861 Douglas, Thomas, Mains of Rhynie, Fearn
 1874 Douglas, William, Arbol, Fearn
 1876 Fleming, David G., Ardullie, Dingwall
 1884 Fletcher, J. D., of Rosehaugh, Inverness
 1855 Forsyth, John, Auchoye, Parkhill
 1883 Fowler, J. A., yr. of Braemore, Inver-broom House, Garve
 1886 Fraser, John G., Easter Rarichie, Fearn
 1886 Gibson, Rev. John, Avoch Manse
 1874 Goodbrand, James H., Culnaha, Nigg
 1874 Gordon, J. A., of Arabella, Nigg
 1875 Gordon, John, Cullisse, Nigg
 1874 Grant, George, Pollo, Invergordon
 1875 Gunn, William, Strathpeffer, Dingwall
 1874 Hall, John, Tomich, Invergordon
 1883 Henderson, James, Culcairn, Inver-gordon
 1884 Henderson, John, Factor, Fortrose
 1889 Henderson, Thomas, Assistant Factor, Fortrose
 1879 Inglis, George, of Newmore, Invergordon
 1885 Jackson, Major Randle, of Swordsale, Evanton
 1883 Littlejohn, Alex., of Invercharron, Ardgay
 1889 Lumaden, John Wm., Navty, Cromarty
 1874 MacGregor, James G., Fearn
 1875 MacIntyre, Robert, St Martins, Conon Bridge
 1875 M'Intyre, P. B., Mains of Findon, Conon Bridge

Admitted

- 1877 Mackay, Henry, Shandwick Mains, Nigg
 1872 Mackenzie, Andw., Dalmore Distillery, Alness
 1883 Mackenzie, Colin Lyon, of St Martins, Braelangwell, Invergordon
 1891 Mackenzie, Farquhar, Corn Factor, In-vergordon
 1865 Mackenzie, James Fowler, of Allan-grange, Munlochy
 1854 MACKENZIE, Sir Kenneth S., of Gairloch, Bart., Conon House
 1865 Mackenzie, Roderick G., of Flowerburn, Fortrose
 1883 Mackenzie, Wm., Delny, Delny Station
 1883 Mackenzie, William, Kinnairdie, Ding-wall
 1883 Maclean, Roderick, Ardmoss, Alness
 1875 MacLennan, Alexander, Leunassie, Loch-alsh
 1888 M' Rae, Ewen M., Kinbeachie, Conon Bridge
 1878 MacRae, Donald, Moultaivie, Alness
 1887 MATHESON, Sir Kenneth J., of Ardmoss, Bart., Alness
 1887 Matheson, William, Newton, Evanton
 1881 MIDDLETON, Lord, Applecross, Loch-cartron
 1875 Middleton, A. A., Roscarn, Invergord-on
 1864 Middleton, George, Cornon, Dingwall
 1872 Middleton, Jon., Davidson, Invergord-on
 1872 Middleton, Jon., Clay of Allan, Fearn
 1889 Middleton, T. H., Roscarn, Invergord-on—*Free Life Member*
 1875 Mitchell, Andrew, Ratagan House, Loch-alsh
 1851 Monro, David, of Allan, Tain
 1881 Mundell, Walter, Moy, Muir of Ord
 1870 Mundell, W. G., Inverlael, Lochbroom
 1883 MUNRO, Sir Hector, of Foulis, Bart., Dingwall
 1877 Munro, John, of Leulair, Dingwall
 1891 Murdoch, Alex., Dalnavie, Alness
 1875 Murdoch, James, Drynie Mains, Inver-ness
 1884 Murray, Charles, of Lochcarron, Ding-wall
 1864 Murray, D., Grunard, Poolewe
 1883 Murray, William, Bellfield, Inverness
 1857 Murray, William, Kulooy, Killcarnan
 1874 Paterson, Wm. G., Ord, Invergordon
 1879 Peterkin, W., Dunglass, Conon Bridge
 1884 Pirie, A. G., of Leckmelm, Ullapool
 1875 Preston, W. C., Achonachie Lodge, Muir of Ord
 1884 Reid, N., New Kelso, Strathcarron, Ross-shire
 1860 Robertson, Dr C., Auchtercairn, Gair-loch
 1869 Robertson, Chas., of Kindeace, Inver-gordon
 1874 Robertson, John, Mountegle, Fearn
 1872 Robertson, Peter, Achilty, Strathpeffer
 1864 Ross, David, Banker, Dingwall
 1872 Ross, George, Merchant, Dingwall
 1876 Ross, James, Balblair, Edderton
 1874 Ross, John, Meikle Tarrel, Fearn
 1887 Ross, W. C., of Cromarty
 1889 Scott, James, Balmaduthy, Munlochy
 1849 Sellar, P. Plenderleith, Hartfield, Tain
 1864 Smith, Alexander P., Munlochy Farm, Munlochy
 1891 Stirling, Captain William, yr. of Fair-burn, Balavil House, Conon Bridge
 1888 St Quintin, Geoffray Aspley, Cromarty
 1891 Walker, William, Farmer, Alness
 1868 Warrand, Major A. J. C., Ryefield, Fer-rintosh
 1875 Young, James, Cadboll, Fearn

SUTHERLAND.**Admitted**

- 1865 Barclay, Thomas, Skelbo Castle, Dornoch
 1876 Blake, John, Dalchork, Lairg
 1876 Brebner, Robert, Skibo Mains, Dornoch
 1884 Cameron, Alexander, Drumuie, Golspie
 1883 Clarke, G. G., Eriboll, Lairg
 1856 Dudgeon, John B., Crakaig, Loth
 1883 Flower, Charles E., of Glencassley, Rosehall
 1856 Gunn, Alexander, Achley, Dornoch
 1883 Gunn, John, The Hermitage, Golspie
 1851 Hill, Robert, Navidale House, Helmsdale
 1874 Hill, Robert Robertson, Navidale House, Helmsdale
 1854 Houstoun, Wm., Kintradwell, Brora

Admitted

- 1883 Lawrie, Robert, Glencassley, Rosehall
 1890 Mackintosh, John, Proncy, Dornoch
 1850 M'Iver, Evander, Scourie House, Lairg
 1888 M'Lean, Donald, Dunrobin, Golspie
 1847 Marshall, John, Clebrig, Lairg
 1844 Menzies, Duncan, Blairech, Lairg
 1874 Mitchell, James R., Culgower, Loth
 1863 Mitchell, Wm., Ribigill, Tongue
 1888 Scott, Adam, Sciberscross, Golspie
 1870 Scott, John, Clebrig, Lairg
 1883 Shaw, James T., Gordonbush, Brora
 1879 Stewart, John, Dunrobin Mains, Golspie
 1849† SUTHERLAND, His Grace The Duke of, K.G., Dunrobin, Golspie
 1865 Sutherland, E. C., of Skibo, Dornoch
 1885 Urquhart, John, Cambusavie, Dornoch

8.—BORDER DISTRICT.

EMBRACING THE

COUNTIES OF BERWICK, PEEBLES, ROXBURGH, AND SELKIRK.

BERWICK.

Admitted

1854 Allan, John, Peelwalls, Ayton
 1863 Allan, Robt. A., Allan Bank, Eyemouth
 1874 Bertram, John, Addinston, Lauder
 1854 Bertram, John S., Cranshaws, Duns
 1877 Black, George, Sea-View Works, Berwick
 1866 Bolam, Robt. George, Berwick-on-Tweed
 1885 BOSWALL, Sir G. Houstoun, of Blackadder, Bart., Chirnside
 1867 Bromfield, W. J., Old Greenlaw, Greenlaw
 1891 Broomfield, George L., Solicitor, Lauder
 1854 Broughton, R. H., of Rowchester, Greenlaw
 1888 Brown, Colonel, Longformacus, Duns
 1872 Brownlie, Alex., Haughhead, Earliston
 1883 Brydon, Thos. T., Burncastle, Lauder
 1884 Calder, T. A., Billie Mains, Reston
 1872 Calder, W. A., Oxenrig, Coldstream
 1834 CAMPBELL, Sir H. Hume, of Marchmont, Bart., Duns
 1880 Carmichael, John, Bellevue, Coldstream
 1860 Chirnside, G., Edrington House, Berwick
 1889 Cookson, C. L. Stirling, Renton, Grant's House
 1884 Cossar, Mark, Greenknowe, Duns
 1872 Cowe, Peter, Butterdean, Grant's House
 1870 Cowe, Robert, Old Castles, Chirnside
 1883 Cranston, Robert, Pathhead, Cockburnspath
 1881 Craw, H. H., West Foulden, Berwick
 1882 Craw, James, Whitson Hill, Chirnside
 1853 Crawford, Alex., Writer, Duns
 1857 Darling, Adam, Governor's House, Berwick
 1880 Darling, Thomas, 1 Palace Street East, Berwick
 1887 Deas, Adam, Briery Bank, Duns
 1882 Dickenson, Robert, Longcroft, Lauder
 1859 Dickenson, Wm., Longcroft, Lauder
 1863 Dodds, William, Elwartlaw, Greenlaw
 1863 Dryden, William, Coldstream
 1884 Dunn, James, Blainslie, Lauder
 1889 Edington, Wm., Dowlaw, Coldingham, Ayton
 1854 Elder, Thos., Wedderburn Mains, Edrom
 1854 Elder, W., Implement Works, Berwick-on-Tweed
 1889 Elliot, Frank, Middlestots, Duns
 1884 Elliot, Walter, Whitlaw, Lauder
 1884 Elliot, William, Ellenford, Duns
 1882 Ferguson, J., Duns Castle Estate Office, Duns
 1884 Fulton, John, Hatchednize, Coldstream
 1878 Gibb, Robert Shirra, Boon, Lauder—
Free Life Member, 1885
 1864 Gibson, J., Gunsgreen Hill, Ayton
 1882 Gilroy, James, Berwick-on-Tweed
 1870† HAMILTON, Hon. R. B., Langton, Duns
 1880 Henderson, Robert, East Gordon, Gordon
 1881 Herbertson, Robert H., Fans, Earliston

Admitted

1884 Herriot, David, Whitelaw, Edrom
 1854 Hogg, Thomas, Hope Park, Coldstream
 1860 HOME, Right Hon. The Earl of, The Hirsell, Coldstream
 1874 Home, Col. D. Milne, of Wedderburn, Paxton House, Berwick
 1880 Hood, James, Cove, Cockburnspath
 1854 Hood, T., Coldstream Mains, Coldstream
 1884 Hood, Thos., Factor, Coldstream
 1877 Hood, W., The Cove, Cockburnspath
 1879 Hope, A. Peterkin, Sunwick, Berwick
 1886 Hope, Capt. Charles, of Cowdenknowes, Earliston
 1876 Hunter, Jas., of Antonhill, Coldstream
 1857 Johnston, James, Huntingdon, Lauder
 1872 Kynoch, Dr Patrick, Greenlaw
 1886 Laurie, John H., Hardens, Duns
 1884 Leadbetter, H. M., Legerwood, Earliston
 1859 Lockie, William, Choicelce, Duns
 1884 Logan, Adam S., Ferney Castle, Reston
 1870 Logan, J. W., Brow of the Hill, Berwick
 1872 Loney, Peter, Marchmont, Duns
 1863 Macbraire, J., of Broadmeadows, Berwick
 1868 M'Dougal, George, Blythe, Lauder
 1891 M'Dougal, James, Lylestone, Lauder
 1885 M'Lean, David, Estate Office, The Crooks, Coldstream
 1881 Mack, Joseph, Berrybank, Reston
 1870 Menzies, John, Bankhead, Duns
 1884 Middleton, Hilton, Kimmerghame Mains, Duns
 1873 Mill, Allan, Dods, Lauder
 1889 Millican, Gilbert T., Harelaw, Chirnside
 1872 Muirhead, Frank, Paxton, Berwick
 1888 Nisbet, Alex., Marigold, Edrom, Duns
 1880 Nisbet, George, Rumbleton, Greenlaw
 1870 Nisbet, Jas., of Lambden, Greenlaw
 1872 Paterson, James, Kidshielhaugh, Duns
 1880 Porteous, James, Solicitor, Coldstream
 1872 Rae, Robt., Burnbank, Fouldon, Berwick
 1878† REAY, The Right Hon. Lord, Carolside, Earliston
 1884 Renwick, G. J., Corsbie, Earliston
 1872 Robeson, George, Springwells, Coldstream
 1863 Romanes, Robert, of Harryburn, Lauder
 1872 Rutherford, A., Rumbleton Law, Gordon
 1872 Scott, Peter, Whiterig, Ayton
 1890 Scott, Thomas, Abbey St Bathans, Grant's House
 1872 Shiel, Andrew, Coldstream
 1884 Shillinglaw, Wm., Haymount, Duns
 1861 Simson, George, Courthill, Kelso
 1863 Smith, Alex., Letham, Berwick
 1890 Smith, Andrew, of Whitechester, Duns
 1864 Smith, F. C., Hoprig, Cockburnspath

Admitted

- 1872 Smith, J. F., Darnchester, Coldstream
 1880 Somervall, J. A., Broomdykes, Chirnside
 1874 Thompson, Richard, Chapel, Duns
 1884 Swan, Robert G., Duns
 1880 Swinton, J. L. Campbell, of Kimmerghame, Duns
 1855 Thomson, James, Mungoswalls, Duns
 1863 Torrance, George, Leetside, Chirnside
 1863 Torrance, T., Laws, Whitsome
 1844 Turnbull, John, of Abbey St Bathans, Grant's House
 1884 Tweedie, David, Nether Howden, Lauder
 1884 Watson, W. H., Ruthven, Coldstream
 1877 Weatherhead, Wm., Bogangreen, Coldingham
 1863 Weddell, John Wilkie, Lauder Barns, Lauder
 1885 Welsh, Alex., Seedsman, Coldstream
 1863 White, A., Kellose Mains, Edrom
 1880 White, E. C., Ayton Law, Ayton
 1872 White, Wm., Lennel Hill, Coldstream
 1872 Wight, R. B., Ecclaw, Cockburnspath
 1889 Wilkie, Jas. Bruce, of Foulden, Berwick
 1851 Wilson, John, Wellnag, Duns
 1862 Wilson, J., Chapelhill, Cockburnspath
 1837 Wilson, Philip, Corn Factor, Duns
 1874 Wyllie, James, Pathhead, Cockburnspath

PEEBLES.

- 1873 Anderson, John, Cramalt, Coppercleuch, Selkirk
 1884 Ballantyne, Wm., Wormiston, Eddleston
 1882 Beresford, J. G. M., of Macbiehill, Lamancha
 1877 Black, Wm. Connel, of Kailzie, Peebles
 1875 Blackwood, Alex., Stobo Mill, Stobo
 1872 Brown, Wm., Parkgatestone, Biggar
 1884 Cairns, John, Winkston, Peebles
 1881 Carmichael, G. H. G., Castle Craig, Dolphinton
 1856 CARMICHAEL, Sir Wm. H. Gibson, of Skirling, Bart., Castle Craig
 1874 Dickson, W. L., Drumelzier Haugh, Biggar
 1884 Dyson, F. W., Crossburn, Peebles
 1874 ELIBANK, Right Hon. Lord, Minden, Eddleston
 1884 Ellis, John, Waterhead, Eddleston
 1887 Erskine, Rear-Admiral James E., of Venlaw, Peebles
 1882 FERGOUSON, Sir James R., of Spitalhaugh, Bart., West Linton
 1884 Fletcher, D. M., Drumelzier Place, Biggar
 1880 Forrest, George, Edston, Stobo
 1884 Forrest, T. M., Edston, Stobo
 1876 Gordon, Charles, of Hallmyre, Lamancha
 1884 Gracie, Charles A., Easter Happrew, Stobo
 1882 Greenshields, Dav., Garvald, Dolphinton
 1880 Harper, J., Traquair Mains, Innerleithen
 1882 HAY, Sir John Adam, of Haystoun, Bart., Kingsmeadows, Peebles
 1873 Linton, Simon, Glenrath, Manor
 1869 Mackenzie, C. J., of Portmore, Eshiel, Peebles
 1848 MONTGOMERY, Sir G. Graham, of Stanhope, Bart., Stobo Castle, Stobo—
Honorary Secretary of the Society
 1846 Montgomery, John B. H., Stobo Castle, Stobo
 1852 Muir, G. W., Kirkhouse, Traquair
 1884 Murray, W. J., Dawyck, Stobo
 1889 Newbigging, Thomas, Corstane, Biggar
 1882 Paterson, J., South Slipperfield, West Linton
 1881 Ritchie, G. D., Cloverhill, Biggar
 1885 Slater, Andrew, Haystoun, Peebles

Admitted

- 1889 Smart, James, jun., Cowieslenn, Eddleston
 1844 Stewart, G., Kerfield Cottage, Peebles
 1880 Stodart, Thomas Tweedie, of Oliver, Rachan Mill, Biggar
 1853 TENNANT, Sir Chas., of The Glen, Bart., Innerleithen
 1890 Tennant, Edward P., yr. of The Glen, Innerleithen
 1877 Thom, Alex., Chapelhill, Peebles
 1886 Thorburn, M. G., of Glenormiston, Innerleithen
 1889 Thorburn, William, Craigerne, Peebles
 1873 Tweedie, A. G., Hearthstone, Broughton, Peebles
 1860 Tweedie, James, of Quarter, Biggar
 1887 Watson, James, Blyth-Bank, Dolphinton
 1873 Williamson, Miss Katharine Isabella, of Cardrona, Peebles
 1859 Wilson, J. F., Newton Villa, Peebles
 1881 Wilson, James, Burnetland, Biggar
 1884 Wilson, James, West Mains, Dolphinton
 1860 Woddrop, W. A., of Garvald, Dolphinton

ROXBURGH.

- 1872 Alexander, George, Easter Lilliesleaf, St Boswells
 1889 Anderson, Thomas, St Boswells Bank, St Boswells
 1884 Ballantyne, David, Shaws, Newcastleton
 1860 Ballingall, George, Clarilaw, St Boswells
 1863 Balmer, Thomas, Melrose
 1863 Barrie, James, Harden Mains, Jedburgh
 1886 Beattie, John, Braidlie, Newcastleton
 1867 Bell, Alex., Samieston, Jedburgh
 1885 Bell, Wm. Scott, yr. of Woll, Hawick
 1881 Blaikie, Wm. L., Holyden, St Boswells
 1859 Borthwick, A. H., Ladiesyde Lodge, Melrose
 1889 Boyd, Andrew, F.R.C.V.S., Melrose
 1861 Boyd, John B., of Cherrytrees, Kelso
 1863 Boyd, W. B., Faldonside, Melrose
 1880 Broad, Anthony, Edenside Road, Kelso
 1872 Brodie, J., Southbank, Bowden, St Boswells
 1880 Brown, J., East Housebyres, Galashiels
 1884 Brown, Jas., Land Steward, Floors, Kelso
 1889 Brown, Thomas, Carpenter, Melrose
 1866 Brunton, James, Broomlands, Kelso
 1872 Calder, Adam, Halterburn, Kelso
 1853 Calder, Francis, Yetholm Mains, Kelso
 1881 Carmichael, T. D. Gibson, yr. of Skirling, Chiefswood, Melrose
 1876 Carre, T. A. R., of Caverscarre, St Boswells
 1871 Caverhill, John, Jedneuk, Jedburgh
 1867 Charlton, M., jun., Browndeanlaws, Jedburgh
 1884 Clark, S. T., Chapelhill, Hawick
 1854 Clay, John, Cherrysters, Kelso
 1880 Cochrane, A. L., of Kingsknowes, Galashiels
 1872 Croall, John, Coach Works, Kelso
 1872 Cunningham, C. J., of Muirhouselaw, Wooden, Kelso
 1879 Cunningham, J. W. B., Grahamshaw, Kelso
 1884 Cunningham, Robt., Glendouglas, Jedburgh
 1889 Curle, Alexander, of Priorwood, Melrose
 1865 DALRYMPLE, Hon. G. Gray, Elliston House, St Boswells
 1880 Davidson, Alexander, Auctioneer, Melrose
 1870 Davidson, Gilbert, Banker, Hawick
 1872 Davidson, Wm., Colmslie, Galashiels
 1890 Davidson, Wm., Cattle Salesman, Jedburgh

Admitted

1854 Dickson, A., of Hassendeanburn, Hawick
 1863 Dodd, James, Hundalee Cottage, Jedburgh
 1863 Dodd, Nicholas, Nisbet, Jedburgh
 1869 Douglas, Francis, Springwood Park, Kelso
 1887 DOUGLAS, Sir George B., of Springwood Park, Bart., Kelso
 1871 Douglas, George, Upper Hindhope, Jedburgh
 1867 Douglas, George Sholto, 5 Abbotsford Grove, Kelso
 1862†Dudgeon, J. Scott, Longnewton, St Boswells
 1876 Dunn, John, Ramsay Lodge, Kelso
 1863 Elliot, Henry, Greenriver, Hawick
 1880 Elliot, James, Burnhead, Hawick
 1875 Elliot, James T. S., of Wolflee, Hawick
 1863 Elliot, John, The Flat, Newcastleton
 1874 Elliot, Robert Henry, of Clifton Park, Kelso
 1866 Elliot, Walter, Hernutage, Newcastleton
 1872 Elliot, Wm. B., of Benrig, St Boswells
 1878 Erskine, Charles, Chiefswood, Melrose
 1863 Fair, John S. Elliot, Wells, Jedburgh
 1884 Fairbairn, J. J., Greenend, St Boswells
 1889 Fairfax, Rear-Admiral Henry, C.B., of Old Melrose
 1884 Fleming, John, Roan, Newcastleton
 1872 Forsyth, James (Hooper & Co.), Kelso
 1889 Freer, John, Writer, Melrose
 1855 Gardner, Robert, Gattonside, Melrose
 1843 Gibson, Thomas, Haymount, Kelso
 1884 Grierson, Robert, Whitechesters, Hawick
 1878 Grieve, C. J., Branhholm Park, Hawick
 1890 GRIFITH, Sir Richard Walfie, of Hendersyde Park, Bart., Kelso
 1857 Haddon, Andrew, Honeyburn, Hawick
 1880 Haddon, Walter, Solicitor, Hawick
 1889 Halliburton, J. H., Jed Bank, Jedburgh
 1889 Hamilton, George, Abbey Hotel, Melrose
 1889 Henderson, James, Eildon Mains, St Boswells
 1863 Henderson, James, Tweedmount, Melrose
 1882 Henry, Lieut.-Gen., C.B., The Pavilion, Melrose
 1863 Hilson, George, Solicitor, Jedburgh
 1862 Hobkirk, James, Broadhaugh, Hawick
 1889 Hutton, John, V.S., Kelso
 1887 Johnston, John S., Crailinghall, Jedburgh
 1889 Johnston, Wm. Lee, Oxnam Neuk, Jedburgh
 1890 Karr, H. Seton, M.P., of Kippielaw, St Boswells
 1871 Kay, Robert, Softlaw, Kelso
 1833 Kerr, W. S., of Chatto, Sunlaws, Kelso
 1890 Kidd, Henry, Lowood, Melrose
 1880 Laing, Thomas (Laing & Mather), Kelso
 1880 Laing, Walter, Denholm Hill, Hawick
 1872 Lawrie, Thomas, Ormiston Road, Melrose
 1863 Lees, Richard, Drinkstone, Hawick
 1870 Lockhart, W. Elliott, Branhholme, Hawick
 1800*†LOTHIAN, The Marquis of, K.T., Monteviot, Jedburgh
 1883 Macpherson, Donald, Wolfelee, Hawick
 1880 Maxwell, John, Coachbuilder, Kelso
 1863 Mein, Ben., Roxburgh Barns, Kelso
 1863 Minto, Right Hon. The Earl of, Minto House, Hawick
 1886 Moffat, James, Craik, Hawick
 1863 Murray, John, of Woolplaw, Galashiels
 1889 Noble, Robt., of Borthwickbrae, Hawick
 1860 Ogilvie, George, Holefield, Kelso
 1886 Oliver, Andrew R., Thornwood, Hawick
 1889 Oliver, Geo. Lindsay, Whithaugh, Newcastleton

Admitted

852 Oliver, James, of Thornwood, Hawick
 880 Oliver, John, Borthaugh, Hawick
 853 Oliver, Robert, of Blakelaw, Lochside, Kelso
 873 Oliver, Wm. M., Howpasley, Hawick
 1889 Paton, Major James, of Crailing, Jedburgh
 863*†POLWARTH, Right Hon. Lord, Mertoun, St Boswells
 1889 POLWARTH, The Hon. The Master of, Mertoun, St Boswells (Humbie House, Upper Keith)
 1854 Pott, Gideon, of Dod, Knowesouth, Jedburgh
 1856 Rawdin, Joseph, Chemist, Jedburgh
 1863 Rea, Charles, Cleithaugh, Jedburgh
 1872 Renwick, John, Nurseryman, Melrose
 1852 Riddell, Wm., Hundalee, Jedburgh
 1889 Robertson, John, Borthwickbrae, Hawick
 1863 Robertson, John, Falside, Stithel, Kelso
 1863 Robertson, Robert, Ladyrig, Kelso
 1889 Rodger, James, Mertoun Estate Office, St Boswells
 1880 Ross, Richard, Rutherford, Kelso
 1863 ROXBURGH, His Grace The Duke of, Floors Castle, Kelso
 1871 Roy, Fred. Lewis, of Nenthorn, Kelso
 1889 SCOTT, The Hon. H. J., Mertoun, St Boswells
 1883 SCOTT, Hon. J. C. Maxwell, of Abbotsford, Melrose
 1884 Scott, Chas., Milsington, Hawick
 1863 Scott, George, Kersknowe, Kelso
 1882 Scott, H. J. E., of Makerston, Kelso (Weston, Underwood, Derby)
 1863 Scott, J. S. E., Kirndeane, Newcastleton
 1881 Scott, John Corse, of Synton, Hawick
 1889 Scott, John Robson, yr. of Newton, Jedburgh
 1863 Scott, Robert, Falsash, Hawick
 1863 Scott, T., of Mersington, Leitholm, Coldstream
 1860 Scott, T. Robson, of Newton, Jedburgh
 1863 Scott, W., Meivinslaw, Jedburgh
 1863 SCOTT, Sir W., of Ancrum, Bart., Jedburgh
 1883 Sinclair, C. G., Linthaughlee, Jedburgh
 1879 Smith, James, Kelso
 1880 Smith, John, Mowlaugh, Kelso
 1888 Smith, J. R. C., Mowlaugh, Kelso—*Free Life Member*
 1881 Smith, R. C., Ormiston, Jedburgh
 1887 Smith, Thomas A., Kirkton, Hawick
 1888 Sprot, Edward William, of Drygrange, Melrose
 1887 Sprot, Lieut.-General John, of Riddell, Lilliesleaf
 1872 Stavert, Archd., of Hoscote, Hawick
 1851 Stedman, James, Timpenean, Jedburgh
 1880 Storie, W. G. R., Lanton, Jedburgh
 1880 Tait, George, Venchen, Yetholm
 1846 Tait, James, Banker, Kelso
 1872 Tait, James, St Boswells
 1867 Thomson, A., of Mainhill, St Boswells
 1863 Thomson, Geo., Hopton, Ancrum, Jedburgh
 1889 Thomson, William, Whitelee, St Boswells
 1863 Turnbull, J., Eastfield, Kelso
 1889 Turnbull, Mark, Melrose
 1863 Turnbull, W. Geo., Spittal, Jedburgh
 1863 Turnbull, Wm. J., Beaumont Cottage, Sprouston
 1853 Usher, John, Stodrig, Kelso
 1872 Usher, J. jun., Gatehousecote, Hawick
 1872 Usher, Thomas, jun., Courthill, Hawick
 1880 Waddell, Alex., of Palace, Jedburgh
 1889 Watson, T. Lindsay, Seaburn, Hawick
 1886 Watson, Capt. W. S., of Burnhead, Hawick (care of T. Usher, Courthill, Hawick)

Admitted

- 1890 White, Alex., Nottylees, Kelso
 1863 Wilson, George, Manufacturer, Hawick
 1864 Wood, James, Whitehill, Stitchell, Kelso

SELKIRK.

- 1866 Anderson, B. T. G., of Tushielaw, Selkirk
 1863 Anderson, G., of Hawthorn Bank, Selkirk
 1863 Brown, Adam, Hyndhope, Selkirk
 1889 Brown, James, Ashwood, Galashiels
 1867 Brunton, J. S., of Hiltonshill, Ladhope House, Galashiels
 1862 Brydon, Adam, Netherbarns, Galashiels
 1889 Connachie, Thomas D., V.S., Galashiels
 1877 Connachie, William Dixon, V.S., Selkirk
 1877 Dennistoun, J. W., of Dennistoun, Harewood Glen, Selkirk
 1871 Dun, John, Galashiels
 1869 Elliot, A. T., Newhall, Galashiels
 1889 Elliot, John, Meigle, Galashiels
 1854 Elliot, Thomas, Blackhaugh, Galashiels
 1860 Elliot, Walter, Hollybush, Galashiels
 1889 Gibson, Thomas, jun., Torwoodlee, Galashiels

Admitted

- 1873 Grieve, James, Howden, Selkirk
 1885 Grieve, James, jun., Fernielee, Selkirk
 1875 Howatson, J. L., Ramsaycleugh, Selkirk
 1878 Laidlaw, Robert, Rodono, Selkirk
 1889 Laidlaw, Thomas R., Langshaw, Galashiels
 1849 Lang, Hugh M., of Broadmeadows, Selkirk
 1878 Lang, Robert J., Broadmeadows, Selkirk
 1889 Lawrence, David, Whytbank, Galashiels
 1878 Lindsay, John V., Whitehope, Selkirk
 1879 M'Queen, John, Oakwood, Selkirk
 1880 Mitchell, Thomas, Howford, Selkirk
 1880 Muir, John, Dryhope, Yarrow, Selkirk
 1843†NAPIER and ETRICK, Right Hon. Lord, K.T., Thirlestane Castle, Selkirk
 1885 Plummer, Chas. H. S., of Sunderland Hall, Selkirk
 1863 Potts, Andrew, Beechwood, Selkirk
 1859 Pringle, Alex., of Whytbank, Selkirk
 1863 Pringle, J. T., of Torwoodlee, Galashiels
 1873 Reekie, Wm., Carterhaugh, Selkirk
 1880 Riddell, John, Rink, Galashiels
 1889 Scott, Alex., Ladhope, Selkirk
 1880 Scott, John, of Gala, Galashiels
 1880 Turnbull, James, Fauldshope, Selkirk
 1872 Wilson, George, Greenhill, Selkirk

ENGLAND.

Admitted

- 1855 Alexander, John, 9 Raymond Terrace, Cheltenham
 1873 Anderson, J., Bradbury, Enville, Stourbridge
 1850 Anderson, Robert Hood, Devonshire Club, London
 1863 Angus, John, Whitefield, Morpeth
 1864 Archer, Thomas, 1 Westminster Chambers, Victoria Street, London
 1861 Archibald, James, Petre Hall, Coventry
 1873 Ashdown, A. H., Castle House, Shrewsbury—*Free Life Member*
 1863 Askew, Wilson, of Pallinsburn, Coldstream
 1873 AVELAND, Right Hon. Lord, Normanton Park, Oakham
 1883 Aveling, T. L., Rochester
 1890 Bamford, Henry, jun., Leighton Iron Works, Uttoxeter
 1883 Bardgett, John, Sockbridge Mill, Tirrel, Penrith—*Free Life Member*
 1880 Barrett, Robert Bell, Skipton Castle, Skipton
 1886 Barton, J. P., Hopwas Grange, Tamworth
 1869 Bayne, Lewis, Kinnel Park, Abergeldie
 1869 Bell, Robt., Lyndale Lodge, Needham Market, Suffolk
 1877 Bell, T. (Messrs Robey & Co.), Lincoln
 1884 Benson, R. A., Duchy of Cornwall Office, Liskeard, Cornwall—*Free Life Member*
 1848 Bethune, A., North Down Lane, Bideford, N. Devon
 1882 Bigg, Thos., Great Dover Street, London
 1885 Birch, W. de Hoghton, Kerry, Montgomeryshire—*Free Life Member*
 1874 Bird, Ebenezer, Ramornie, Kington, Herefordshire
 1865 Black, Major Alexander, 8 Manor Place, Paddington, London, W.
 1859 Black, John, Ford, Northumberland
 1883 Blackett, J. S., Bongate Hall, Appleby, Westmoreland
 1863 Bolam, John, Bilton, Lesbury, Northumberland
 1879 Bonnor, G. H., 14 Cockspur Street, Pall Mall, London, S.E.
 1870 Boog, Thomas E., Schidy Office, Cambourne, Cornwall
 1864 Borton, John, Barton House, Malton
 1875 Brotchie, G., Grinkle, Loftus, R.S.O.
 1874 Browne, A. H., Doxford Hall, Chathill
 1873 Browne, Colville, 55 Ashburnham Road, Bedford—*Free Life Member*
 1868 Bruce, Robert, Elm Grove, Darlington
 1862 Bruce, Hon. T. C., 42 Hill Street, Berkeley Square, London, W.
 1884 Brydon, John, Seed Merchant, Darlington
 1873 Brydon, Robert, The Dene, Seaham Harbour—*Free Life Member*
 1886 BUCCLEUCH and QUEENSBERRY, The Duchess-Dowager of, Boughton House, Kettering
 1870 BURDETT-COUTTS, Baroness, 1 Stratton Street, Piccadilly, London

Admitted

- 1870 Cairns, John, Fernbank, Heaton Chapel, Stockport
 1841 Caldwell, Fred., 4 Hanover Terrace, Regent's Park, London
 1878 Cameron, H. E., Newton Leys, Ashbourne, Derbyshire
 1838 CAMPBELL, Sir James, Bart., Wheatmead Park, Lydney
 1880 Carnegie, Wm. C., Sarsden, Chipping Norton
 1878 Carr, Robt., Felkington, Norham, Berwick-on-Tweed—*Free Life Member*
 1887 Carrington, George, M.R.A.C., Missenden Abbey, Great Missenden, Bucks—*Free Life Member*
 1838 Carstairs, D., Hailes House, Fairfield, Liverpool
 1877† Cecil, Lord Arthur, Orchardmains, Tunbridge
 1877 Cecil, Lord Lionel, Orchardmains, Tunbridge
 1884 Chambers, T. W., Prospect House, Pelutho, Abbeystown
 1846 Christie, J., 10 Pitville Parade, Cheltenham
 1884 Clark, J. M., Featherstone Castle, Haultwhistle
 1873 Clark, William, New Mousen, Belford
 1877 Clench, F. (Messrs Robey & Co.), Lincoln
 1884 Clinton, W. E. Pelham, Moore Court, Stroud—*Free Life Member*
 1890 Colquhoun, William E. Campbell, yr. of Killermont, Osberton Grange, Worksop
 1857 Collyer, W. D., Craig Nethan, Weston-super-Mare
 1851 COLVILLE of Culross, Right Hon. Lord, K.T., 41 Eaton Place, London
 1877 Corbett, T., Perseverance Iron Works, Shrewsbury
 1854 Cowan, R., St Kilda, Sidmouth, Devon
 1879 Crabb, Wm., Silloth, Cumberland
 1890 Crabtree, Henry, 54 Wakehurst Road, Clapham Junction, London, S.W.—*Free Life Member*
 1882 Craig, Robert, Crondon Park, Ingatestone, Essex
 1860 Crawford, Daniel, Potterells Farm, Hatfield, Herts
 1868 Cruikshank, Edward C., Shrublands, Graffham, Petworth, Sussex
 1874 Dallas, A. G., 10 Tervor Terrace, London, S.W.
 1887 Davies, Edward Smith, Claverley, Bridgenorth, Salop—*Free Life Member*
 1859 Dawson, J., Lymore, Montgomery, N. Wales
 1869 Dickie, Joseph, The Bank House, The Broadway, Tooting, London, S.W.
 1886 Dickson, Thos. A., Estate Office, Overstone Park, Northampton—*Free Life Member*
 1849 Dixon, Thomas G., Dolbon, St Asaph
 1880 Dollar, T. A., V.S., 56 New Bond Street, London

Admitted

- 1887 Don, H. G., Ryehills, Marske-by-the-Sea, Yorkshire
 1871 Donne, Henry, Leek Wootton, Warwick
 1872 Douglas, Thomas, 5 Charlotte Square, Newcastle
 1861 DRUMMOND, Hon. F., 58 St George's Square, London
 1874 Duff, G. Smytlan, 58 Queen's Gate, South Kensington, London, S.W.
 1879 Duncan, John, Tilney, St Lawrence, Kings Lynn
 1882 Duncan, Robert, Berwick Farm, Stamford River, Essex
 1871 Eden, Henley, United University Club, Pall Mall East, London
 1878 Edmondson, T., 144 Princes Street, Old Garratt, Manchester
 1873 Eley, Rev. Dr Wm. H., Etchingham Rectory, Hawkhurst—*Free Life Member*
 1875 ELLESMERE, The Right Hon. The Earl of, Worsley Hall, Manchester
 1880 Elliot, John, of Binks, Neville House, Hereford Road, Southsea, Hants
 1873 Elliot, Prof. Thos. J., Hole Park, Rolvenden, Kent—*Free Life Member*
 1880 Ellis, O. W., 6 Grosvenor Place, Jesmond, Newcastle-on-Tyne
 1882 Ensor, Thos. H., 54 South Street, Dorchester—*Free Life Member*
 1886 Faber, Alfred D., Belmont, Ilfracombe—*Free Life Member*
 1869 Ferme, G., Leigham Lodge, Roupell Park, Streatham Hill, Surrey
 1870 Fisher, John, Knolls, Carlisle
 1881 Fleming, Hugh, Felmersham, Bedford
 1856 Forbes, C. W., Sandecotes, Parkstone, Dorset
 1854 Friar, Thomas, of Grindon Ridge, Northam-on-Tweed
 1877 Gell, H. C. Pole, Hopton Hall, Wirksworth
 1869 Gibbons, T., 24 Cheswick Street, Carlisle
 1879 Gibson, J. G., 1 Vanburgh Park, Blackheath, London
 1889 Gilchrist, D. A., University College of North Wales, Bangor — *Free Life Member*
 1882 Gilkes, Gilbert, Canal Iron Works, Kendal
 1873 Goddard, H. R., Belsay, Newcastle-on-Tyne—*Free Life Member*
 1875 Gordon, W. R. G., Barsham Lodge, Sandown, Isle of Wight
 1866 Gough, Wm., Land Agent, Wykeham
 1881 Gover, L. D., 6 Broadwater Road, Worthing—*Free Life Member*
 1886 Gow, George, South Collingham, Newark, Notts
 1869 Graham, George, Oakbank, Longtown
 1865 Graham, Paul, Brooks's Club, London
 1888 Graham, William, Eden Grove, Kirkbythore, Penrith
 1862 GRANT, Field-Marshal Sir Patrick, G.C.B., Chelsea Hospital
 1858 Gray, T. R., St Margaret's, Cheltenham
 1883 Gregory, Rev. A. T., Trusham Rectory, Bovey Tracey
 1871 Greig, David (John Fowler & Co.), Leeds
 1870 Greig, James A., Estate Office, Fawley Court, Henley-on-Thames
 1884 Gwynne, A. T. J., of Monachty, Cardigan
 1869 Haldane, R., Barlees, Cornhill-on-Tweed
 1884 Hall, David, Ingram, Alnwick
 1877 Hall, T. F., Dunster House, Mark Lane, London, E.C.
 1888 Handley, John, Greenhead, Milnthorpe
 1887 Handley, William, Greenhead, Milnthorpe, Westmoreland

Admitted

- 1884 Hardy, C. W. L., Gittisham, Honiton—*Free Life Member*
 1867 Harris, Wm., 16 The Grove, Blackheath, London, S.E.
 1875 Haughton, W. H., Highlands, Gt. Burford, St Neots
 1887 Haviland, W. A., Warbleton, Heathfield, Sussex
 1883 Hayward, C. P., Beaumont Manor, Lincoln
 1885 Henderson, George, Shidlaw, Coldstream
 1878 Henderson, John, Oakfield, Kingsbury, Middlesex—*Free Life Member*
 1854 Henderson, Thos., Hastings Cottage, Seaton Delaval, Newcastle-on-Tyne
 1881 Henderson, W., East Eltrington, Hexham—*Free Life Member*
 1877 Herdman, George, The Abbey Farm, Massingham
 1883 Hetherington, R. B., Earl Street, Carlisle
 1873 Hill, A. J., 36 Lansdowne Road, London, W.—*Free Life Member*
 1873 Holliday, Jonathan, Kirkhampton, Carlisle
 1878 Holliday, Wm., Pelutho West House, Abbey Town, Carlisle
 1878 Holliday, Wm., Plumbland, Aspatria, Carlisle
 1886 Hooper, C. H., Pains Hill, Cobham, Surrey—*Free Life Member*
 1880 Hope, A., Cleveland Cottage, Middleton in Teesdale
 1878 Hope, John W., 3 Runford Street, Liverpool
 1878 Hornsby, J., Spittalgate Ironworks, Grantham
 1863 Howie, H. B., North Hazelrigg, Belford
 1865 Hudspeth, Wm., Green Croft, Haltwhistle
 1872 Hughes, G. P., of Middleton Hall, Wooler
 1869 Hume, Archibald, 14 Imperial Square, Cheltenham
 1879 Hunt, A. E. Brooke, Holmsley, Slough, Bucks—*Free Life Member*
 1868 Hutton, Arthur, Lorton, Tottenhall, Cheshire
 1888 Inman, A. H., care of Glyn, Mills, Currie, & Co., 67 Lombard Street, London, E.C.—*Free Life Member*
 1870 Jefferson, R., Cunninggarth, Wigton, Cumberland
 1855 Jobson, W., Ashfield Villa, Heaton, Newcastle
 1873 Juckes, R. F., Harley, Much Wenlock—*Free Life Member*
 1870 Keith, Lieut.-Col. Jas., Denington Hall, Framlingham, Suffolk
 1875 Kennedy, W., Lewes and County Club, Lewes—*Free Life Member*
 1883 Kenyon, J. W., Oxly Woodhouse, Fartown, Huddersfield
 1874 Kidd, H., V.S., Market Place, Hungerford, Berks
 1850 Kidston, Jn. P., Nym Park, Barnet, Herts
 1862 Kilpatrick, P., 32 Old Kent Road, London
 1863 Laing, George, Wark, Coldstream
 1868 LAWES, Sir John B., Bart, Rothamstead, St Albans
 1878 Leggat, Alex., Burnsbridge, Cowick, Selby
 1875 Lightfoot, H. Le Blanc, Fonthill Abbey, Salisbury
 1875 Linn, W., 2 Park Terrace, Newcastle-on-Tyne
 1885 LONDONDERRY, Most Noble The Marquis of, Seahamhall, Seaham Harbour
 1881 Lonsdale, Claud, Rose Hill, Carlisle

Admitted

- 1885 LOPES, Sir Massey, Bart., 28 Grosvenor Gardens, London
 1850 Lowndes, Major Jas., Junior United Service Club, London
 1884 Lyal, William, Myton Grange, Helperby, York
 1854 Macandrew, D. M., Kilrock, Asheldon Road, Torquay
 1878 M'Connell, P., Ongar Park Farm, Ongar—*Free Life Member*
 1878 M'Cracken, W., Crews—*Free Life Member*
 1886 M'Creath, H. G., Galagate House, Northam-on-Tweed
 1888 Macdonald, Alex., Editor, *Farmer and Stockbreeder*, 325 Strand, London
 1841 Macdonald, Major-Gen. Alister M'Ian, 27A Park Lane, London, W.
 1879 M'Gregor, Alex., Leigh, Lancashire
 1865 Macgregor, Thos., Argyll House, Castle-town Road, West Kensington, S.W.
 1882 Mackay, John, 31 Beresford Road, Birkenhead
 1875 Mackay, Thomas, Westwood, Coventry
 1874 M'Kerrow, A., Benster Farm, Hyam, Sheffield
 1868 Mackintosh, Dr C. H., Morden Hall, Torquay
 1846 Mackintosh, G. G., Richmond House, Twickenham
 1880 M'Laren, John, Hunslet, Leeds
 1884 Maclean, John D., of Lazenby Hall, Penrith
 1846 Macleay, Alex. D., Conservative Club, London, W.
 1839 Macleay, Kenneth, 1 Portland Place, London
 1865 M'Lennan, Donald, 42 Sackville Street, Piccadilly, London, W.
 1883 M'Leod, J. M., 224 Park Road, Crouch End, London, N.
 1886 M'Minnies, Henry H., Farington, Preston—*Free Life Member*
 1870 M'Monies, J., Chevening Estate Office, Sevenoaks, Kent
 1865 MACNAUGHTEN, Sir Stuart, Bitterne Manor House, Southampton
 1870 M'Naughton, D., 79 Mark Lane, London, E.C.
 1870 M'William, Robert, Alstonby, Carlisle
 1875 Maddison, H., The Lindens, Darlington
 1870 Main, G. Agnew, Portland Square, Carlisle
 1884 Malcolm, John, M.R.C.V.S., Birmingham—*Free Life Member*
 1880 Mangin, W. Nangreave, Preston, Chathill
 1861 Mangles, Geo., Givendale, Ripon, Yorkshire
 1882 Mann, Robt. J., Home Farm, Acton Burnell, Shrewsbury
 1884 Marriott, T. E., Newnham House, Daventry
 1873 Marryat, George Selwyn, The Close, Salisbury
 1868 Marshall, James, Gainsborough
 1888 Massey, Fred. J., 54 Bunhill Row, London
 1884 Maxwell, Hon. B. C., 1 Gloucester Place, Portman Square, London, W.
 1879 Meade-Waldo, E. W., Barnoor Castle, Beal
 1877 Millican, J., Wedholm House, Abbey Town
 1873 Mitchell, John, Toftthill, Dunchurch, Rugby
 1869 Moffat, James, White Lion, Brompton
 1852 Moncrieff, Col. Alex., C.B., F.R.S., 15 Vicarage Gate, Kensington, London, W.
 1861 MONTAGU of Beaulieu, Lord, Palace House, Beaulieu, Southampton
 1885 Moore, George, Longhirst, Morpeth

Admitted

- 1839 Moore, John C., Brook Farm, Cobham, Surrey
 1878 Moubray, J. M., Broom Court, Alcester
 1880 Moul, John, Royal Buildings, New-castle-on-Tyne
 1865 Mounsey, J. T., of Kingfield, Longtown
 1877 Mounsey, Wm. R. Lowther, Newton, Penrith
 1888 Muir, James, Yorkshire College, Leeds—*Free Life Member*
 1873 Munby, E. C., The Hermitage, Oswald-kirk—*Free Life Member*
 1867 Murray, G., Elvaston Castle, Derby
 1865 NEPHEW, Sir M. H., of Lodgers Court, Bart., Bridport
 1872 Newton, T. H. G., Barrels Park, Henley-in-Arden, Birmingham
 1878 Nicholson, W. N., Newark
 1882 Nickels, John Tetley, Montford, Montford Bridge
 1879 North, G. F., Wroxton Estate Office, Banbury
 1853 Ogilvie, Wm. R., Skelton, Penrith
 1874 Ogilvy, John F., 21 The Grove, South Kensington, London
 1872 Oliphant, L. J., Guards' Club, London
 1875 Ord, J. R., Houghton Hall, Darlington
 1867 Paterson, C., Canford Manor, Wimborne
 1857 Paton, A., Norwood, Sydenham, London
 1864 Pelham, C. T., Cound Rectory, Shrewsbury
 1869 Pender, John, 66 Old Broad Street, London
 1888 Perkins, W. F., M.R.A.C., Portswood House, Southampton—*Free Life Member*
 1889 Pilkington, Claude M., Wollaton, Nottingham
 1885 Pollock, Tho., Estate Office, Boduant, Eglwysbach, R.S.O., Denbighshire
 1885 Prentice, Manning, Chemical Works, Stowmarket
 1883 Quibell, W. O., Highfield House, Newark
 1878 Ransome, James Edward, Ipswich
 1870 Rawline, J. D., Rose Farm, Formby, Liverpool
 1878 Reay, Thomas, Abbey Town, Carlisle
 1857 Redfern, W. Macquarrie, Conservative Club, St James Street, London
 1877 Rennie, John, Egmont Farm, Newark, Notts
 1873 Richardson, Jn., London Road, Carlisle
 1878 Richardson, R. A., 128 Shiel Road, Newsham Park, Liverpool
 1888 Richmond, Jas. G., Globe Works, South-hall Street, Manchester
 1880 Riddle, Andrew, Yeavinger, Wooler
 1852 Rintoul, Chas., Strawberry Hall, Buxted, Sussex
 1876 Robertson, George, Athenæum Club, Pall Mall, London
 1886 Robertson, Charles T. A., Little Horringer Hall, Bury St Edmunds—*Free Life Member*, 1888
 1861 Robertson, S. S., L. & N.-Western Railway, Broad Street, London
 1878 Robinson, Thos., Cargo, Carlisle
 1884 Robson, Jacob, Byrness, Otterburn
 1881 Rodger, Geo., Newton Bank, Preston Brook
 1838 Rodger, R., Hadlow Castle, Tunbridge
 1873 Rome, Thos., Charlton House, Charlton Kings—*Free Life Member*
 1879 Roscoe, Wm. C., Broughall House, Whit-church, Shropshire
 1880 Ross, D. A. M., 62 Lombard Street, London, E.C.
 1870 Ross, J., The Grove, Ravensglass, Carn-forth

Admitted

- 1890 Rudd, Ash, East Ruston Hall, Stalham, Norwich—*Free Life Member*
 1870 Ryrie, R., 34 Park St., Grosvenor Sq., London
 1855 SANDILANDS, Hon. James, 31 Princess' Gate, London
 1870 Saunders, R. B., Hutton Grange, Gisorborough, Yorkshire
 1872 Selby, B. P., Paston, Coldstream
 1890 Sessions, Harold, Russell House, Gloucester—*Free Life Member*
 1873 SINCLAIR, The Right Hon. Lord, 55 Onslow Square, London, S.W.
 1854 Smith, Wm., Melkington, Cornhill
 1891 Spence, Arthur George, 3 St Aidan's Terrace, Birkenhead
 1887 Stanhope, John Montague Spencer, Cannon Hall, Barnsley, Yorkshire
 1869 Statter, T., jun., Stand Hall, Whitefield, Manchester
 1884 Stephen, H. C., Avenue House, Finchley, London
 1880 Stephenson, C., V.S., Sandford Villa, Newcastle
 1853 Stewart, J. A. Shaw, 71 Eaton Place, London
 1863 Stewart, Neil P., Vaynol, Bangor, North Wales
 1877 Stirling, A., 30 Eccleston Street, London, S.W.
 1884 Sturdy, Norman, Thurstonfield Tannery, Carlisle
 1865 Swanwick, R., R.A.C. Farm, Cirencester
 1888 Thompson, Henry, V.S., Aspatria
 1867 Thompson, H., of High Green, Ramsdike, Otterburn
 1883 Tiffen, J. H., 4 Grosvenor Terrace, Hull—*Free Life Member*
 1869 Tinning, J., Lowther Street, Carlisle
 1889 Toppin, John C., Musgrave Hall, Skelton, Penrith
 1866 Trotter, T. C., 54 Park Street, Grosvenor Square, London, W.
 1859 Turner, Frederick J., Mansfield, Woodhouse, Mansfield, Notts

Admitted

- 1889 Turner, Thos. Warner, Welbeck, Worksop, Notts
 1878 Twentymann, J. M., Hawkrigg House, Wigton, Cumberland
 1877 Unite, Jn., 291 Edgeware Rd., London, W.
 1877 VANE, Sir H. R., of Hutton in the Forest, Bart., Penrith
 1860 Vassal, Lieut.-Gen. R., 9 Westbourne Street, Hyde Park, London
 1872 Walker, J. P. S., Littlegate, Oxford
 1873 Wall, Geo. Y., Durham—*Free Life Member*
 1854 Wallbank, Jonas, Berwick-on-Tweed
 1873 Walton, G. K., Long Causton, Shipston-on-Stour—*Free Life Member*
 1883 Wardman, Robert, Warwick Bank House, Carlisle
 1868 Watt, James, Knowfield, Carlisle
 1886 Webb, Major W. G., of Woodfield, Wordsley, Stourbridge
 1881 Weber, F. H., 41 High Street, Guildford—*Free Life Member*
 1890 Webster, J. Hume, Marden Deer Park, Caterham Valley, Surrey
 1860 Welsh, John, Rudfen Manor, Kenilworth
 1863 WHARNCIFFE, Right Hon. Lord, 15 Curzon Street, London
 1888 Wilkie, Thomas, Forester to the London County Council, 21 Belleville Road, Wandsworth, London, S.W.
 1854 Willis, T., Manor House, Carperby, Bedale
 1859 Wilson, Sir Jacob, Chillingham Barns, Alnwick—*Free Life Member*, 1873
 1873 Wilson, William, Leigh, Lancashire
 1873 Wilson, Wilham, Low Barniston, Washington Station, Durham
 1873 Wood, W. A., 36 Worship Street, London, E.C.
 1881 Woodroffe, D., Chace View, Rugeley
 1876 Wordsworth, R. W., Whitemoor House, Ollerton, Notts
 1879 Young, R. W., of Colinswell, Hetchley Hall, Hinckley, Leicestershire
 1873 Young, Wm., Burroughs, Sacombe, Ware, Herts
 1877 ZETLAND, Earl of, Aske, Richmond, Yorkshire

IRELAND.

- 1883 Bonallo, W. C., Claudeboye, Co. Down, Ireland
 1869 Brodie, Jas. W., Cloheen, Buttevant, Co. Cork
 1873 Campbell, Geo., Kilkea, Mageny, Co. Kildare—*Free Life Member*
 1880 Cross, Alex., 4 College Gardens, Belfast
 1877 Fennessy, Thomas, Grange Villa, Waterford
 1838 Fox, Richard M., of Foxhall, Rathowen

- 1876 Gilchrist, And., Powers Court, Enniskerry, Co. Wicklow
 1884 Goulding, W. J., Roebuck Hill, Booters-town
 1883 Macdonald, James, Royal Dublin Society, Kildare Street, Dublin
 1876 Maconchy, J. A., Kildare Street Club, Dublin—*Free Life Member*
 1889 Purcoy, Edward B., Greenfields, Tipperary—*Free Life Member*

FOREIGN COUNTRIES.

- 1880 Aalvik, E. A., Ostenso, Hardanger, Norway
 1882 Alexander, A. S., 216 Clark St., Chicago—*Free Life Member*
 1876 Anderson, R. Lang, Manager, The Aboukir Company, Limited, Ramleh, Egypt—*Free Life Member*
 1864 Arbuthnott, Hon. Mrs., Norway
 1881 Auld, R. C., Tillyfour, Pinckney, Michigan, U.S.A.
 1868 Baird, Arthur E., Brussels
 1887 Banerjee, N. N., Calcutta—*Free Life Member*
 1888 Basu, G. C., 196 Bowbazar St., Calcutta—*Free Life Member*

- 1876 Bean, William, Rosebank, Solsgirth, Manitoba
 1881 Blyth, A. H., Frankfield, Manitoba
 1842 Booth, James G., Seed Merchant, Hamburg
 1851 Bogle, John, Auckland, New Zealand
 1878 Bramwell, John, River Plate Trust Loan and Agency Co., Calle San Martin 56, Buenos Ayres—*Free Life Member*
 1876 Brown, J. H., Wairoa, New Zealand
 1879 Brydane, W. S., Dunedin, New Zealand
 1874 Burn, Forbes, care of The National Agricultural Society of Victoria, Bourke Street, Melbourne—*Free Life Member*

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| <p>Admitted</p> <p>1879 Cantlie, Charles A., Natal</p> <p>1850 Christie, A., Glencairn, Dipton, Southland, New Zealand</p> <p>1864 Cotesworth, Robert, Cannes, France</p> <p>1868 Craig, R. (Francis Lowe & Co.), Chapelton, Jamaica</p> <p>1875 Crerar, Donald, Estancia Lucerne, Pergamino, F.C.O., Buenos Ayres</p> <p>1883 Croil, Thos., North Western Sledge, Co. Milwaukee, Wisconsin, U.S.A.</p> <p>1872 Currie, James J., Blankbunny, Birtle, Manitoba</p> <p>1877 Curror, Adam Henry, Studio, Sherman Block, St Paul's, Minnesota, U.S.A.</p> <p>1874 Dahl, Ferdinand August, Director of the Royal Higher Agricultural School at Aas, Christiania—<i>Honorary Associate</i></p> <p>1876 Donaldson, Alexander, 54 Avenue Wagram, Paris</p> <p>1888 Drieberg, Christopher, Colombo, Ceylon—<i>Free Life Member</i></p> <p>1855 French, J., Sortkjeer, Fredrickshaven, Denmark</p> <p>1873 Giglioli, Italo, Professor of Agricultural Chemistry, Portici—<i>Free Life Member</i></p> <p>1870 Gordon, R. W., British Columbia (c/o John Gibson, Howford, Peebles)</p> <p>1855 Graham, H., Auckland, New Zealand</p> <p>1827 Graham, James, Toronto, Canada</p> <p>1867 Hallen, J. H. B., M.R.C.V.S., Inspecting Veterinary Surgeon, Bombay</p> <p>1863 Hardie, William H., Gamboola, Casterton, Victoria, Australia</p> <p>1871 Heggie, Henry, Roseburg, Douglas Co., Oregon, U.S.</p> <p>1880 Hoggan, Andrew, jun., Queensland</p> <p>1880 HOLMES, The Hon. Matthew, Cintra, Dunedin, New Zealand</p> <p>1874 Holst, Christian, Chamberlain to his Majesty Oscar II., and Norwegian Court Paymaster, Christiania—<i>Honorary Associate</i></p> <p>1890 Kerr, James, Schatzi Station, Ramleh, Egypt—<i>Free Life Member</i></p> <p>1864 King, David, Dunedin, New Zealand</p> <p>1875 Leithhead, James, Mokoia, Woodville, Hawkes Bay, New Zealand</p> <p>1885 Lowrie, William, Prof. of Agriculture, Roseworthy, South Australia—<i>Free Life Member</i></p> <p>1883 Macpherson, John, Invercargill, New Zealand</p> | <p>Admitted</p> <p>1860 Mein, N. A., Hotel de Emperoure, Boulevard, Dunbanchago, Nice</p> <p>1889 Middleton, T. H., Baroda College, Baroda, India—<i>Free Life Member</i></p> <p>1859 Mills, G., Glenmona Park, Bung Bong, Victoria</p> <p>1861 Mitchell, David, Dalton, Ottertail County, Minnesota, U.S.</p> <p>1883 Mollison, James, jun., Fort-Macleod, Alberta, N.W.T.</p> <p>1886 Moos, N. A. F., Bombay, Poona—<i>Free Life Member</i></p> <p>1861 Morison, James, Topeka, Kansas</p> <p>1886 Mukerji, N. G., Bhownanipur, Calcutta—<i>Free Life Member</i></p> <p>1878 Nonnen, J. E., Norway—<i>Free Life Member</i></p> <p>1875 Pringle, A. T., 42 Market Street, Sydney, N.S.W.</p> <p>1877 Pudney, R. L., Dookie Farm School, Cashel, Victoria, Australia—<i>Free Life Member</i></p> <p>1879 Reid, F. Robertson, jun., Merrill, Iowa</p> <p>1855 Robertson, John, Mount Abundance, Queensland, care of Alex. Nimmo, West Bank, Falkirk</p> <p>1878 Robertson, J., of Golden Grove, Adelaide, South Australia</p> <p>1859 Robertson, W. M., 32 Bedford Street, Port Hope, Canada</p> <p>1881 Sandison, Marcus, Natal—<i>Free Life Member</i></p> <p>1880 Scott, Charles, South Africa, care of John Scott, 4 Elliot Street, Glasgow</p> <p>1866 Shiels, George, Monett, Mo., U.S.A.</p> <p>1873 Turner, Peter, Balsam Grove, Drumquinn, Ontario, Canada</p> <p>1869 Tweeddale, George W., Ivy Hill, Westminster, Nelson County, Virginia, U.S.</p> <p>1871 Tweedie, Richard, The Forest, Clydesdale Stud Farm, Douglas, Kansas</p> <p>1867 Walker, J., Grassmere, Stonewall, Winnipeg, Manitoba</p> <p>1862 Walker, John, Howley House, Cape Town</p> <p>1874 Walker, R. H., Queensland</p> <p>1852 Watson, William, Beecher Wills, Illinois, U.S.</p> <p>1865 Whyte, James, Waimea Road, Nelson New Zealand</p> <p>1879 Wilson, John, jun., Gilbrea, Oakville, County Halton, Ontario—<i>Free Life Member</i></p> <p>1858 Witherspoon, Archibald, West Oxford, Canterbury, New Zealand</p> |
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MEMBERS WHOSE RESIDENCES ARE UNKNOWN.

[Members knowing the present Address of the following Gentlemen, or being aware of their Death, will please communicate with the Secretary, 3 George IV. Bridge, Edinburgh.]

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| <p>1851 Aitchison, James (late Proncy Mains, Dornoch), Australia</p> <p>1870 Aitchison, Peter (late West Garleton, Haddington), America</p> <p>1869 Aitken, Robert, late Kilmany, Cupar-Fife</p> <p>1870 Anderson, John S., late Dalhousie Mains, Dalkeith</p> <p>1878 Anderson, Robt., late Donmaheich, Pitlochry</p> <p>1845 Askew, Henry William, late Conishead, Priory, Ulverston</p> <p>1851 Austin, R. S., late Middleton, Muthill</p> <p>1865 Baillie, John B., late of Leys, Inverness</p> <p>1872 Bell, Andrew, late Fans, Earliston</p> <p>1869 Bell, William, late Kennacoll, Dunkeld</p> | <p>1873 Bisset, Hugh, late Pitarrow, Laurencekirk</p> <p>1851 Black, Jas. (late Factor, Ellon), London</p> <p>1836 Blane, Colonel Robert, C.B.</p> <p>1870 Blacklaw, Alex. Scott (late Milton of Arbuthnot, Fordoun), Brazil</p> <p>1873 Bland, Thos., late Greystone, Tullynessle</p> <p>1878 Brodie, William, late of Bush, Barkerland, Dumfries</p> <p>1852 Brown, Andrew, M.D., late Edinburgh</p> <p>1861 Brown, James, late St Andrews</p> <p>1872 Brown, J., late Murrays, Orniston, Tranent</p> <p>1874 Bruce, A. H. T., late of Falkland, Ladybank</p> |
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Admitted

- 1871 Bruce, Geo. C., late Roucouerte, West Virginia, U.S.
 1875 Bruce, Wm. L., late Glenkill, Lamlash
 1870 Bryan, F. G. D., late 73 Bath Street, Glasgow
 1877 Bryce, W. C., late 27 Berkeley Terrace, Glasgow
 1864 Brydon, H., late Knocknarling, New Galloway
 1850 Bryson, Robert, Merchant, Glasgow
 1875 Buchanan, Wm. (late Glasgow), America
 1868 Burn, John, late Ednam, Kelso
 1844 Cadell, Lt.-General, late Upper Norwood, London
 1882 Cameron, Donald, late Mossfield, Oban
 1862 Cameron, William, late Factor, Kingussie
 1863 Campbell, A. H., late of Little Grove, Herts
 1838 Campbell, J. (late Merchant, Glasgow), London
 1863 Campbell, George William, late Mayfair, London
 1863 Campbell, T. H., late Guernsey
 1878 Campbell, Wm., late Carterton, Lockerbie
 1856 Carnegie, Hon. Charles, late St Andrews
 1850 Carnegie, John, Glasgow
 1864 Chalmers, Wm., late Soutartan, Fergue
 1880 Chaplin, G. Robertson, late of Murlingden, Brechin
 1880 Chaplin, Captain T. R., late Lawhead House, Carnwath
 1881 Chirnside, John, late 48 Albany Street, Edinburgh
 1850 Christie, Charles J., late Westbank, Tranent
 1876 Christie, James M., late Sunnyside, Prestonkirk
 1857 Clark, John, late Flender, Busby
 1872 Clark, John Moir, late Kinchyle, Fitzjohns Avenue, London
 1869 Clark, Matthew, late Croftengea, Alexandria
 1873 Coningham, W. J. C., late High Street, Haddington
 1864 Cousland, Jas. (late Banker, Denny), Glasgow
 1881 Cowan, Walter, late Blairhoyle, Stirling
 1852 Cowie, James, late The Elms, Dulwich Common, London, S.E.
 1875 Craig, H. V. Gibson, late Deans Court, Wimborne
 1870 Craig, Robert, late Airdrie, Kirkbean, Dumfries
 1867 Craig, Robert, late Tarbert, Lochfyne
 1863 Craike, Charles (late Esbie, Lochmaben), Australia
 1869 Currer, John F., late Damhead, Murrayfield
 1872 Currer, Peter (late Coxithill, Stirling), New Zealand
 1860 Dalziel, Alex., late Glenwharrie, Sanquhar
 1875 Dangerfield, Edward (late Balboughty, Perth), U.S.A.
 1868 Dick, Wm., late of Tullymet, Ballinluig
 1883 Dowall, J. P., late Kelly Bleachfield, Arbroath
 1867 Downie, William, late Kinbroom, Rothiemorman
 1857 Drife, James (late Barr, Sanquhar), New Zealand
 1864 Drummond, John, of Balquhandy, late Gulliton Rectory, Wingham, Kent
 1874 Duff, Thomas, late Manor House, Sidmouth, Devonshire
 1876 Dunbar, Garden Duff, late of Hempriggs
 1868 Duncan, James (late Killichonan, Rannoch), New Zealand
 1880 Dundas, T. G., late of Carron Hall, Larbert

Admitted

- 1857 Dunlop, Alexander, Glasgow
 1832 Dyson, Thos. C., late of Willowfield, Halifax
 1858 Edmonds, Leonard, London
 1850 Edwards, Matthew, late Hilton, Alloa
 1884 Elliot, Robert, late Burnmouth, New-castleton
 1843 Farquharson, Major-General Francis
 1870 Ferme, Chas., late Blackhall, Tulliallan
 1854 Fleming, James (late Three Mile Town, Linlithgow), Glasgow
 1865 Fleming, John (late London), Bombay
 1848 Fletcher, Major C. E., late of Corsick
 1830 Forbes, George, Merchant, London
 1852 Forman, Robert, late Keith House, Upper Keith
 1849 Fox, Michael, jun., late Glencorse Mains, Penicuik
 1873 Fraser, H. N., late Tembain, Grey Town, King William Town, Cape Colony
 1840 Frazer, John (late Cronarty House), London
 1856 Frazer, Hugh, late 29 Arundell Gardens, London
 1859 Gangee, John, late 1 Great Winchester Street Buildings, London
 1857 Garden, William, late Hardgate, Govan
 1875 Gibson, Francis, late Oatfield, Drem
 1875 Gilchrist, Wm., late Knivocklaw, Loudoun
 1842 Giles, James, late of Kailzie
 1849 Gillespie, James, late Craigie, Cramond Bridge
 1875 Gillespie, Jas. John (late Parkhall, Douglas), New Zealand
 1873 Glen, James, late Helensburgh
 1847 Glen, John, late Merchant, Edinburgh
 1875 Gordon, A. Hay, late of Mayen, Huntly
 1866 Gordon, Christ., late Cannerie, Parton
 1870 Gordon, John (late Culraven, Kirkcudbright), America
 1863 Gordon, Thomas Dempster, late of Balmaghie, Castle-Douglas
 1863 Graham, Jas., late of Southbar, Paisley
 1873 Graham, Robt. G., late Burnfoot-on-Esk, Longtown
 1853 Grant, Ken., late Pilmuir Villa, Forres
 1869 Greig, P. M., late 56 Inverleith Row, Edin.
 1884 Grieg, W. F., late 55 Bath St., Glasgow
 1878 Grieve, Gilbert, late Cardiff
 1875 Haig, Wm. (late North St., St Andrews), Australia
 1871 Hain, Thomas, late Glasgow
 1865 Halliday, Thos., late Rosehall Foundry, Haddington
 1861 Hamilton, Daniel, late 66 Hutchison Street, Glasgow
 1855 Hamilton, J. B. (late Burnhouse, Carnwath), London
 1883 Hamilton, H. W., late Uffington, Stamford—Free Life Member
 1876 Hannay, Robert, late Bournemouth
 1871 Hardie, Charles, late Primrose, Dunfermline
 1851 Hardie, G. (late Orwell, Kinross), Australia
 1876 Harper, F. V., late Bridgend, Linlithgow
 1864 Harris, Richard H., late Earnhill, Forres
 1846 Harrop, Isaac Worthington, New Zealand
 1841 Hay, Geo. W., late of Whiterigg, Melrose
 1872 Hazle, Alex., late of Blackcraig, New Cumnock
 1847 Henderson, C. J., late Briery Yards, Hawick
 1857 Hood, James (late New Mains, Prestonkirk), Australia
 1864 Horncastle, Henry, late Whitemoor, Ollerton, Newark
 1864 Howden, John, late Nether Braco, Braco
 1853 Hubbach, Joseph, Liverpool

Admitted

- 1871 Hume, Geo. T., late Sunslawhill, Kelso
 1861 Hunter, Herbert, late Burnhead, Lockerbie
 1883 Hutchinson, Alan, late Camserney Cottage, Aberfeldy
 1864 Jack, John S., late Cambusdrennie, Stirling
 1863 Jack, Michael, late Peggy's Mill, Cramond
 1870 Jackson, John, late Bush, Ewes, Langholm
 1878 Jardine, A. M., late Kilnwick Hall, Granswick, Hull
 1878 Kennedy, John B., late Stenhouse, Thornhill, New Zealand
 1842 Kennedy, Wm., Commission Agent, Glasgow
 1863 Ker, E. Martin (late of Gateshaw, Moorebattles, Kelso), London
 1845 Kerr, Wm. Williamson, late Oriel College, Oxford
 1850 King, Jas. F., late 5 Richmond Street, Glasgow
 1883 Laidlay, R. W., late Halls, Dunbar
 1854 L'Amey, J. R., late of Dunkenny
 1843 Lawson, Alex., Merchant, Dundee
 1868 Lawson, George Stoddart, late Edinburgh
 1859 Lawson, H. Graham, late Edinburgh
 1867 Lawson, Thomas, late Sandyford, Kirriemuir
 1855 Lees, John, late Marvingston, Haddington
 1857 Lindsay, James (late Kilchinbuach, Campbeltown), New Zealand
 1884 Lindsay, James (late Wester Haprew, Stobo), Australia
 1863 Livingstone, T. L. F., late of West Quarter, Falkirk
 1865 Lorimer, J., late Achrossan, Tigh-na-bruaich
 1850 Lumsden, G., late Leslie Lodge, Inverurie
 1883 Lumsden, J. W. M., late Balharg, Meigle
 1872 Lyl, William, late Fogorig, Duns
 1870 McAdam, J. N., late High Trees, Marlborough
 1840 Macalister, Alexander, of Loup and Torrisdale
 1840 Macarthur, Major Alexander
 1842 Macarthur, Duncan (late Dunollybeg), New Zealand
 1853 M'Anslan, J., late Kilbridebeg, Cairn-dow
 1871 M'Bean, John (late Factor's Office, Grantown), New Zealand
 1857 M'Chlery, Henry, London
 1884 M'Cowan, George, late Glenmanno, Penpont, Thornhill
 1838 M'Donald, Dr Alex., Prince Edward's Island
 1885 Macdonald, A. C., late Gigha—*Free Life Member*
 1839 Macdonald, Roderick C., late Paymaster, 30th Regiment
 1860 Macdonald, W. S., late The Priory, Newhaven Road
 1871 M'Dougall, John W., late of Orchill, Blackford
 1834 M'Ewan, J., late Tar of Ruskie, Callander
 1872 Macfarlane, John, late 19 Ann Street, Hillhead, Glasgow
 1857 M'Isaac, John, late Dunglass, Campbeltown
 1844 Mackenzie, Daniel, jun., Merchant, Glasgow
 1868 Mackenzie, Sir Jas. D., of Seatwell, Bart., late Dingwall
 1879 Mackenzie, Murdo (late Banker, Tain), America

Admitted

- 1860 M'Knight, Alexander (late of Barlochan, Dalbeattie), London
 1849 MacLaine, George, late 6 Albert Drive, Glasgow
 1859 M'Laren, Joseph (late Greenhead of Arnott, Kinross), Australia
 1874 Macleod, D. D. M.L., late Nairn
 1871 M'Lellan, David, late of Marks, Kirkcudbright
 1873 MacNab, John, late Bracklin, Callander
 1857 M'Phail, Alex. (late Drumgare, Campbelltown), America
 1860 Macpherson, John (late Killihuntly, Kingussie), Ontario, Canada
 1850 Macrae, Don., late 155 Hill St., Garnet-hill, Glasgow
 1874 Macrae, D. A., late Muirton House, Inverness
 1857 M'Tavish, Duncan (late Dalmore, Campbeltown), America
 1848 Maetier, Alex. Walker, late of Durris, Aberdeen
 1856 Marjoribanks, J., late Campdown, Haddington
 1864 Marr, J. A., late of Alderston, Mid-Calder
 1874 Martin, J., late Beechwood Mains, Corstorphine
 1854 Meikle, David, late Inch House, Grange-mouth
 1885 Menzies, John G., late 6 Grosvenor Crescent, Edinburgh
 1873 Michael, James, late Dunmore, Stirling
 1885 Middleton, Captain W. F., late Bellwood, Perth
 1843 Miller, Captain Alex. Penrose, late 92d Highlanders
 1873 Miller, C. W., late Wellwood, Bridge of Allan
 1859 Milne, James (late Meinfoot, Ecclefechan), America
 1874 Mitchell, Andrew, late Drumderfit, Inverness
 1874 Mitchell, Wm., late North Ossensley, Lymington
 1871 Moir, James, late Banker, Alloa
 1873 Mollison, Jas., late Pavonham, Bedford
 1850 Morison, James G., Glasgow
 1843 Moubay, John Marshall, late of Hartwood
 1882 Muir, John G., late Anderston Foundry, Glasgow
 1862 Muirhead, E. W., late The Hill, Putney, Surrey
 1863 Muirhead, George (late Durdie, Errol), London
 1854 Murray, George (late Mount Pleasant, Berwick), New Zealand
 1850 Murray, Robert, late 54 Grove Street, Edinburgh
 1879 Murray, W. G., late Bolfracks, Aberfeldy
 1857 Napier, Dugald (late Port-Dundas, Glasgow), Australia
 1844 Nicoll, Alexander, late York Place, Edinburgh
 1860 Norman, Wm., late Hall Bank, Aspatia—*Free Life Member*, 1873
 1865 Patrick, Jas., late of Kilmun, Argyllshire
 1870 Patterson, Alex., late Lawhill, Auchterarder
 1878 Pitcairn, Henry H., late Tiroran, Mull
 1859 Plenderleith, A., late Moorfoot, Gorebridge
 1863 Primrose, James Thomson, late Sauchland, Ford
 1852 Pringle, R. K., late Shorncliffe, Cheltenham
 1870 Ralston, A. R., late Straiton, Maybole
 1867 Ralston, Andrew W. (late Lagg, Ayr), America

Admitted

- 1837 Ranken, George (late Drumley, Ayrshire), Australia
 1868 Rate, George (late Mungoswells, Drem), America
 1844 Reid, Charles G., W.S.
 1873 Richardson, Alex., late Castleton, Gorebridge
 1861 Richmond, G., late Balhaldie, Braco
 1831 Rickman, Thomas, late Architect, Birmingham
 1865 Ritchie, Charles, late Ladoga Lodge, Musselburgh
 1856 Robertson, J., late 68 Bath Street, Glasgow
 1876 Robertson, Lieut.-Col. James C., late Whitfield, Govan
 1870 Robertson, James A. (late Chapel Park, Kingussie), Virginia, U.S.
 1836 Robertson, James, late 27 Albert Place, Stirling
 1870 Robertson, Peter D., late 9 King Street, London
 1857 Rowan, J. M., late Atlas Works, Glasgow
 1856 Royd, Robert Whyt, late Balbeggie, Kirkcaldy
 1862 Russell, John, late Saughtonhall Mains, Edinburgh
 1853 RUSSELL, Sir Wm., of Charlton, Bart.
 1875 Seobie, N. F., late of Hawkhill, Inverness
 1864 Scott, Lord Charles, late Eildon Hall, St Boswells
 1841 Scott, Captain Robert, late H.E.I.C.S.
 1859 Seton, Henry, U.S., late Tollcross, Edinburgh
 1864 Shand, William (late Crichton, Ford), New York
 1881 Sharp, James, late Viewfield, Blackford
 1873 Sievwright, William (late Solicitor, Lerwick), New Zealand
 1830 Simpson, Alex. Horatio, late Hayes, Uxbridge
 1879 Simpson, Alexander, late Inverness
 1868 Simpson, George (late Burrelles, Banff), America
 1869 Simpson, George, late 2 Lauder Road, Edinburgh
 1871 Simson, Thomas, late Skelpie, Cupar
 1859 Sinclair, Archibald, late Minard, Inverary
 1823 Skinner, Captain C. G. Macgregor, late Caristbrooke House, Isle of Wight
 1863 Slipper, Robert B., late 427 New Cross Road, London
 1858 Smart, John, late Glasgowgo, Blackburn, Aberdeen
 1886 Smith, Andrew, late Whitefield, Coupar-Angus
 1872 Smith, George P., late 3 Viewforth Ter., Edinburgh
 1873 Smith, William B., late 32 Ashchurch Grove, London—*Free Life Member*
 1850 Somerville, Wm., late Merchant, Glasgow
 1860 Spence, A. W., late Glencairn House, Crieff
 1862 Steedman, John, late Charlestown, Dunfermline
 1854 Stegmann, Conrad, late Merchant, Leith
 1855 Steuart, Robt., late Dundale, Gravesend

Admitted

- 1833 Steuart, William (late of Glenormiston), London
 1853 Stevenson, John B. (late Westfield, Queensferry), New Zealand
 1860 Stevenson, Robert, late Banker, Edinburgh
 1870 Stewart, D., late Unthank, Langholm
 1842 Stewart, David, London
 1857 Stewart, William, late 24 Maclean Street, Glasgow
 1864 Stirling, Captain Gilbert, late Royal Horse Guards
 1851 Stoddart, John, late Cawdor Cuilt, Maryhill
 1849 Sutherland, George, late of Forss, Wick
 1852 Sutherland, S., late Springvale, Sheffield
 1848 Symington, Thomas, late Eastside, Penicuik
 1872 Thomas, William, late Pinnacle, Ancrum, Jedburgh
 1873 Thomson, A., late Morton Mains, Lothianburn
 1869 Thomson, Duncan M. (late Stirling), Chicago
 1875 Thomson, Thomas, late Bankhead, Alloa
 1850 Thomson, Thomas, Merchant, Glasgow
 1859 Thornburn, David, late Calgary, Tobermory
 1844 Timins, William, late of Hillfield, Stanmore, Middlesex
 1859 Tod, Alex., late Aikendean, Lasswade
 1876 Traill, Thomas, late of Holland, Kirkwall
 1878 Turnbull, D., late Brieryards, Hawick
 1877 Underwood, Peter, late Mains of Essich, Inverness
 1856 Vere, C. E. Hope, late Ledard, Aberfoyle
 1888 Vincent, E. H., late Lauder Barns, Lauder
 1857 Wakefield, J. Collen, late Eastwood, Thornliebank
 1847 Walker, Charles (late Drumblair), Australia
 1857 Walker, John, late Eastfield, Springburn
 1861 Walker, Robert (late Muirhall, Perth), San Francisco
 1861 Wallace, John, late Illiceston, Broxburn
 1871 Wallace, Wm., late Newton of Collessie
 1855 Watson, Crawford, late The Lone, Tenbury, Worcestershire
 1859 Watson, Douglas (late Thurster, Wick), New Zealand
 1870 Watson, George, late Fushiebrae, Gorebridge
 1872 Watson, Patrick, late Friarstown House, Tullaught, Dublin
 1860 Wilson, James, late Demersyde West, St Boswells
 1844 Wilson, James, late Virginia Street, Glasgow
 1857 Wilson, Thomas, late Auchincorrie, Campbeltown
 1858 Wilson, Wm., late Balquharn, Alford
 1883 Winton, Alex., late Viewhill, Ardersier
 1858 Wood, James, late Crown Street, Aberdeen
 1878 Wyatt, S., late Nydie Mains, St Andrews
 1855 Wyllie, W. A., late 14 West-End Park Street, Glasgow
 1887 Young, James B., late Pitlandie, Perth

TOTAL NUMBER OF MEMBERS, 4900.

HONORARY MEMBERS.

HONORARY ASSOCIATES.

1874 Dahl, Ferdinand August, Aas, Christiania	1874 Holst, Christian, Norwegian Court Paymaster
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LIST OF DIPLOMA FREE LIFE MEMBERS.

By a Bye-law passed in 1878, with reference to the Supplementary Charter of 1856, successful Candidates for the Society's Agricultural Diploma are thereby eligible to be elected Free Life Members of the Society

In 1882, the holders of the Diploma memorialised the Council, pointing out the want of some distinctive title attached to the Diploma, and praying that the title F.H.A.S. (Fellow of the Highland and Agricultural Society of Scotland) be granted to them. The Council acceded to the prayer of the Memorial.

Admitted

- 1879 Aitken, John M., Norwood, Lockerbie
 1882 Alexander, A. S., 216 Clerk St., Chicago
 1876 Anderson, R. Lang, Manager, The Aboukir Co., Limited, Ramleh, Egypt
 1873 Ashdown, A. H., M.R.A.C., Castle House, Shrewsbury
 1887 Banerjee, N. N., Calcutta
 1883 Bardgett, John, Sockbridge Mill, Tirrel, Penrith
 1883 Basu, Girls Chandra, 196 Bowbazar St., Calcutta
 1884 Benson, R. A., Duchy of Cornwall Office, Liskeard, Cornwall
 1885 Birch, Walter de Hoghton, Kerry, Montgomeryshire
 1878 Bramwell, John, River Plate Trust Loan and Agency Co., Calle San Martin 56, Buenos Ayres
 1873 Brown, William, Earlsmill, Forres
 1873 Browne, Colville, M.R.A.C., 55 Ashburnham Road, Bedford
 1878 Brydon, Robert, The Dene, Seaham Harbour
 1874 Burn, Forbes, care of The National Agricultural Society of Victoria, Bourke Street, Melbourne
 1882 Buttar, Thos. A., Corston, Coupar-Angus
 1878 Campbell, George, Kilkea, Mageny, Co. Kildare
 1885 Campbell, Robt. J., Cuil, Castle-Douglas
 1879 Cannon, James, Urich, Castle-Douglas
 1878 Carr, Robert, Felkington, Norham, Berwick-on-Tweed
 1887 Carrington, George, M.R.A.C., Missenden Abbey, Great Missenden, Bucks
 1884 Clinton, W. E., Pelham, Moorecourt, Stroud
 1890 Crabtree, Henry, 54 Wakehurst Road, Clapham Junction, London, S W.
 1879 Craig, John, Innergeldie, Comrie
 1880 Craig, Wm., Gwydyr House, Clreff
 1887 Davies, Edward Smith, Claverley, Bridgenorth, Shropshire

Admitted

- 1886 Dickson, Thos. A., Estate Office, Overstone Park, Northampton
 1888 Drieberg, Christopher, Colombo, Ceylon
 1887 Dunlop, And. T. L., Morriston, Maybole
 1878 Eley, Rev. Dr Wm. Henry, Etchingham Rectory, Hawkhurst, Kent
 1873 Elliot, Prof. Thomas John, M.R.A.C., Hole Park, Rolvenden, Kent
 1882 Ensor, Thomas Henry, 54 South Street, Dorchester
 1874 Erskine, Henry, Buccleuch Square, Langholm
 1886 Faber, Alfred D., Belmont, Ilfracombe, Kent
 1889 Farquharson, A. J., Newtyle, Forfarshire
 1876 Ferguson, Archd. A., 196 High Street, Portobello
 1885 Gibb, Robert Shirra, Boon, Lauder
 1873 Giglioli, Italo, M.R.A.C., Portici
 1889 Gilchrist, D. A., University College of North Wales, Bangor
 1873 Goddard, H. R., M.R.A.C., Belsay, New-castle-on-Tyne
 1889 Gordon, Robert, Gordonston, Clatt, Kennethmont
 1881 Gover, Lawford D., 6 Broadwater Road, Worthing
 1887 Haig, Robt., Dollarfield, Dollar
 1883 Hamilton, H. W., late Uffington, Stamford
 1884 Hardy, C. W. L., Gittesham, Honiton
 1878 Henderson, John, Oakfield, Kingsbury, Middlesex
 1874 Henderson, Richard, Portland Estates Office, Kilmarnock
 1881 Henderson, W., East Elrington, Hexham
 1873 Hill, Arthur James, M.R.A.C., Accountant, 36 Lansdowne Road, London, W.
 1886 Hooper, Cecil H., Pains Hill, Cobham, Surrey
 1879 Hunt, A. E. Brooke, Holmaley, Slough, Bucks

Admitted

1888 Inman, A. H., care of Glyn, Mills, Currie, & Co., 67 Lombard St., London, E.C.

1890 Jeffrey, John J., Blackaddie, Sanquhar
1873 Jukes, R. F., M.R.A.C., Harley, Much Wenlock

1875 Kennedy, William, M.R.A.C., Lewes and County Club, Lewes, Sussex
1890 Kerr, James, Schatzl Station, Ramleh, Egypt

1889 Ledingham, J. K., Slap, Turriff
1885 Lowrie, Wm., Prof. of Agriculture, Roseworthy, So. Australia

1873 M'Connell, Primrose, Ongar Park Farm, Ongar, Essex
1878 M'Cracken, William, Crewe

1876 Maconchy, John Arthur, M.R.A.C., Kildare Street Club, Dublin

1885 Macdonald, A. C., late Gigha, Greenock

1896 M'Minnie, Henry H., Farington, Preston

1887 Maitland, Harry Reid, Muirfold, Grange, Keith

1884 Malcolm, John, M.R.C.V.S., Birmingham

1880 Martin, Wm., Dardarroch, Dumfries

1889 Middleton, T. H., Baroda College, Baroda, India

1873 Milne, John, Inverurie

1886 Moos, N. A. F., Poona, Bombay

1888 Muir, James, Yorkshire College, Leeds

1886 Mukerji, Nitya Gopal, Bhowanipur, Calcutta

1873 Munby, Edward Charles, M.R.A.C., The Hermitage, Oswaldkirk

1875 Murdoch, George Burn, M.R.A.C., 81 Morningside Road, Edinburgh

1875 Murray, Robert W. E., Blackford House, Blackford Avenue, Edinburgh

1878 Nonnen, John Edward, Norway

1873 Norman, Wm., M.R.A.C., late Hall Bank, Aspatia

1882 Norrie, William, Cairnhill, Monquhitter, Turriff

1888 Perkins, Walter Frank, M.R.A.C., Portwood House, Southampton

Admitted

1877 Pudney, R. L., M.R.A.C., Dookie Farm School, Cashel, Victoria, Australia

1889 Purefoy, Edward B., Greenfields, Tipperary

1889 Raeburn, Norman, 49 Manor Pl., Edinburgh

1882 Reid, Peter, Port Ellen, Islay

1888 Robertson, Chas. T. A., Little Horringer Hall, Bury St Edmunds

1873 Rome, Thomas, M.R.A.C., Charlton House, Charlton Kings, Cheltenham

1890 Rudd, Ash, East Ruston Hall, Stalham, Norwich

1881 Sandison, Marcus, Natal

1890 Sessions, Harold, Russell House, Gloucester

1878 Sharp, J. J., Ewingston, Gifford

1882 Smith, E. Hedley, B.L., Whittinghame, Prestonkirk

1888 Smith, J. R. C., Mowhaugh, Kelso

1873 Smith, William B., M.R.A.C., late 32 Ashchurch Grove, London

1887 Somerville, William, B.Sc., F.R.S.E., of Cormiston, Lecturer on Forestry, Edinburgh University

1887 Steele, Daniel, Merkland, New Cumnock

1876 Sutherland, Alex., Rampyards, Watten, Caithness

1883 Tiffen, J. H., M.R.A.C., 4 Grosvenor Terrace, Hull

1873 Torry, Adam Ogilvie, St Ann's Cottage, Coupar-Angus

1873 Wall, G. Y., M.R.A.C., Durham

1878 Wallace, Prof. Robert, University, Edinburgh

1873 Walton, George Kent, Long Campton, Shipston-on-Stour, Warwickshire

1883 Watson, H. A., U.P. Manse, Forres

1881 Weber, F. H., 41 High Street, Guildford

1873 Wilson, Sir Jacob, M.R.A.C., Chillingham Barns, Alnwick

1879 Wilson, John, jun., Gilbrea, Oakville, Ontario

1882 Wright, Robert P., Downan, Ballantrae, Ayrshire

NUMBER OF FREE LIFE MEMBERS, 103.

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